

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

January, 1974
Volume 86, First Half

Founded in 1935 by Carl Murchison

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

ARTHUR G. BILLS
University of Cincinnati

E. A. BOTT
University of Toronto

LEONARD CARMICHAEL
National Geographic Society

IRVIN L. CHILD
Yale University

HERBERT S. CONRAD
U. S. Office of Education

JOHN F. DASHIELL
Florida State University

LEONARD W. DOOB
Yale University

If this space should be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special
edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

FRANK A. GELDARD
Princeton University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

DAVID HOTHERSALL
Ohio State University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

WARREN H. TRICHNER
New Mexico State
University

LEE EDWARD TRAVIS
Fuller Theological
Seminary

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass.
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02657

Microfiche Now Available

Back Issues

While continuing to maintain a complete inventory of paper-bound back issues for all five journals—some reprinted and some original editions—The Journal Press is now offering microfiche (negative silverfiche) versions for all but the last two calendar years: i.e., Volume 1 through 1970 volumes are available immediately; 1971 volumes will first be available in January 1974; 1972 volumes, in January 1975, etc. The minimum order is for one volume. The following rates are in effect: Paper-bound—single numbers, \$9.00; microfiche, not available. Paper-bound—two-part volumes, \$18.00; microfiche, \$6.00. Paper-bound—three-part volumes, \$27.00; microfiche, \$9.00. Paper-bound—four-part and over-four-part volumes, \$36.00; microfiche, \$12.00. The only exceptions (special issues) are starred below.*

VOLUMES	DATES	PRICE PER VOLUME		PRICE THROUGH 1970	
		PAPER	MICRO-FICHE	PAPER	MICRO-FICHE
<i>Journal of Genetic Psychology</i> (Pedagogical Seminary)					
1-117	1891-1970			\$2754.00	\$895.00
1-4	1891-April 1897	\$27.00	\$ 9.00		
5-37	July 1897-1930	36.00	12.00		
38*	1930	18.00	6.00		
39	1931	36.00	12.00		
40 and later	1932-	18.00	6.00		
<i>Genetic Psychology Monographs</i>					
1-82	1926-1970			1872.00	620.00
1-22	1926-1940	36.00	12.00		
23 and later	1941-	18.00	6.00		
<i>Journal of General Psychology</i>					
1-83	1928-1970			1566.00	520.00
1-3	1928-1930	36.00	12.00		
4*	1930	18.00	6.00		
5	1931	36.00	12.00		
6 and later	1932-	18.00	6.00		
<i>Journal of Social Psychology</i>					
1-82	1930-1970			1656.00	550.00
1-10	1930-1939	36.00	12.00		
11 and later	1940-	18.00	6.00		
<i>Journal of Psychology</i>					
1-76	1935/36-1970			1368.00	450.00
1 and later	1935/36-	18.00	6.00		

A mailing charge of \$0.30 per volume is made for foreign delivery of paper editions. Domestic paper mailings carry no postage charge. Prepaid foreign and domestic microfiche orders are also postage free; other orders will be billed for costs. Remittances should be by check or money order payable in U.S. funds on a United States bank, with no bank commission deducted. Advance payment is required from all individuals and from foreign purchasers. Microfilm versions and special bindings are not available. Microfiche orders only may be sent directly to The Journal Press or to Johnson Associates Inc., 175 Fifth Avenue, New York, New York 10010.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

(Founded in 1935 by Carl Murchison)

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

IRVIN L. CHILD
Yale University

LEONARD W. DOOB
Yale University

CHARLES K. FERGUSON
University of California,
Los Angeles

FRANK A. GELDARD
Princeton University

GEORGE M. GUTHRIE
Pennsylvania State
University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

If this space should be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special

edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

DAVID HOTHERSALL
Ohio State University

DARWIN P. HUNT
New Mexico State
University

J. McV. HUNT
University of Illinois

JEROME KAGAN
Harvard University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

ARTHUR J. RIOPELLE
Louisiana State University

WARREN H. TEICHER
New Mexico State
University

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

VOLUME 88

1974

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Published at 2 Commercial Street, Provincetown, Mass.

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 01967

AUTHOR INDEX

Abramowitz, Stephen I.	103	Levenson, Hanna	241
Babad, Elisha Y.	153	Lomranz, J.	223
Blaha, John	65	Mahoney, E. R.	27
Blick, Kenneth A.	113	Martínez, Sonia	317
Brame, John M.	113	May, Richard B.	127
Breen, Lawrence J.	91	Miller, Jim	241
Burgoon, Judee K.	31	Mills, John A.	175
Burgoon, Michael	31	Morris, Vernon B., Jr.	135
Chapman, Antony J.	245	Murgatroyd, Dorothy	97
Chapman, Wendy A.	245	Nedd, Albert N. B.	215
Counts, Dorothea H.	65	Norman, Ralph D.	229
Cox, John A.	299	Ohlson, E. LaMonte	277
Dellas, Marie	325	Patterson, David L.	9
Dickie, Jane R.	333	Prociuk, Terry J.	91
Durand, Douglas	57	Quereshi, M. Y.	77
Engin, Ann W.	121, 289	Rodrigues, Aroldo	47
Epstein, Michael L.	3	Salter, Charles A.	201
Fincham, Shirley A.	175	Schellenberg, James A.	197
Fisher, Bernice	141	Schultz, Beatrice	167
Fisher, Richard I.	147	Seboda, Barbara L.	135
Fleiss Joseph L.	141	Shapira, A.	223
Fodor, Eugene M.	253	Shea, Dennis	57
Gavurin, Edward I.	97	Shihadeh, Emile S.	215
Good, Katherine C.	313	Simon, Robert J.	141
Good, Lawrence R.	313	Smits, Stanley J.	9
Gough, Harrison G.	39	Stephan, Cookie	305
Gurland, Barry J.	141	Stillion, Judith M.	191
Halas, Celia M.	261	Strader, William H.	333
Houston, Judith	277	Vincent, Ken R.	299
Houston, Samuel	277	Wallbrown, Fred H.	65
Hutt, Corinne	127	Wallbrown, Jane D.	65
Klein, Robert E.	317	Ward, Charles D.	135
Lasky, Robert E.	317	Workman, Edward A.	191
Lazzari, Renato	39	Ziviani, Cilio R.	47

TABLE OF CONTENTS

Sex differences in incidental learning and recall of related and unrelated word pairs By MICHAEL L. EPSTEIN	3
Communication bias in black-white groups By DAVID L. PATTERSON AND STANLEY J. SMITS	9
Body-cathexis and self-esteem: The importance of subjective importance By E. R. MAHONEY	27
Unwillingness to communicate, anomia-alienation, and communication apprehension as predictors of small group communication By JUDEE K. BURGOON AND MICHAEL BURGOON	31
A 15-item form of the F Scale and a cross-cultural application By HARRISON G. GOUGH AND RENATO LAZZARI	39
A theoretical explanation for the intermediate level of tension found in nonbalanced P-O-X triads By AROLDI RODRIGUES AND CILIO R. ZIVIANI	47
Entrepreneurial activity as a function of achievement motivation and reinforcement control By DOUGLAS DURAND AND DENNIS SHEA	57
The hierarchical factor structure of the WISC and revised ITPA for reading disabled children By FRED H. WALLBROWN, JOHN BLAHA, DOROTHA H. COUNTS, AND JANE D. WALLBROWN	65
Purposes and procedures of validation By M. Y. QUERESHI	77
Locus of control, study habits and attitudes, and college academic performance By TERRY J. PROCIUK AND LAWRENCE J. BREEN	91
Personality correlates of anagram problem solving By EDWARD I. GAVURIN AND DOROTHY MURGATROYD	97
Personality, the sociocultural environment, and student political activism: Toward a field theory of social behavior By STEPHEN I. ABRAMOWITZ	103
Absolute and relative bidirectional transfer in verbal conflict resolution tasks By JOHN M. BRAME AND KENNETH A. BLICK	113
An analysis of supplementary subtests and their influence on total WISC scores of high achieving students By ANN W. ENGIN	121
Response to stimulus uncertainty in four-, six-, and eight-year-old children By RICHARD B. MAY AND CORINNE HUTT	127
Influence through personal and nonpersonal channels of communication By CHARLES D. WARD, BARBARA L. SEBODA, AND VERNON B. MORRIS, JR.	135
Two methods of psychiatric interviewing: Telephone and face-to-face By ROBERT J. SIMON, JOSEPH L. FLEISS, BERNICE FISHER, AND BARRY J. GURLAND	141

Cognitive appraisal: An examination	147
BY RICHARD I. FISHER	
SES differences in effects of brief social satiation	153
BY ELISHA Y. BABAD	
Characteristics of emergent leaders of continuing problem-solving groups	167
BY BEATRICE SCHULTZ	
Implicit phonological rules in children: An examination of Messer's and Menyuk's work	175
BY SHIRLEY M. FINCHAM AND JOHN A. MILLS	
The relationship between creativity and ego development	191
BY EDWARD A. WORKMAN AND JUDITH M. STILLION	
The effect of pretesting upon the risky shift	197
BY JAMES A. SCHELLENBERG	
Status comparability and attitudes toward a foreign host nation: A cross-cultural study	201
BY CHARLES A. SALTER	
The impact of group therapy on penitentiary vocational and academic education programs	215
BY ALBERT N. B. NEDD AND EMILE S. SHIHADDEH	
Communicative patterns of self-disclosure and touching behavior	223
BY J. LOMRANZ AND A. SHAPIRA	
Sex differences in preferences for sex of children: A replication after 20 years	229
BY RALPH D. NORMAN	
Development of a current scale to measure conservatism-liberalism	241
BY HANNA LEVENSON AND JIM MILLER	
Responsiveness to humor: Its dependency upon a companion's humorous smiling and laughter	245
BY ANTONY J. CHAPMAN AND WENDY A. CHAPMAN	
Group stress, criticism by a subordinate, and the use of power	253
BY EUGENE M. FODOR	
Sex-role stereotypes: Perceived childhood socialization experiences and the attitudes and behavior of adult women	261
BY CELIA M. HALAS	
On determining pornographic material	277
BY JUDITH HOUSTON, SAMUEL HOUSTON, AND E. LAMONTE OHLSON	
The relative importance of the subtests of the Metropolitan Readiness Test in the prediction of first grade reading and arithmetic achievement criteria	289
BY ANN W. ENGIN	
A re-evaluation of Raven's Standard Progressive Matrices	299
BY KEN R. VINCENT AND JOHN A. COX	
Sex prejudice in jury simulation	305
BY COOKIE STEPHAN	

Attitude similarity and liking for a supervisor	313
BY KATHERINE C. GOOD AND LAWRENCE R. GOOD	
Age and sex discriminations in five- and six-month-old infants	317
BY ROBERT E. LASKY, ROBERT E. KLEIN, AND SONIA MARTÍNEZ	
Effects of affective expression on divergent thinking production	325
BY MARIE DELLAS	
Development of mirror image responses in infancy	333
BY JANE R. DICKIE AND WILLIAM H. STRADER	

U. S. POSTAL SERVICE		SEE INSTRUCTIONS ON PAGE 2 (REVERSE)
STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION <small>(Act of August 12, 1970: Section 3685, Title 39, United States Code)</small>		
1. TITLE OF PUBLICATION Journal of Psychology		2. DATE OF FILING Sept. 30, 1974
3. FREQUENCY OF ISSUE 6 issues; published Jan., March, May, July, Sept., Nov.		
4. LOCATION OF KNOWN OFFICE OF PUBLICATION <small>(Street, city, county, state, ZIP code) (Not printers)</small> The Journal Press, 2 Commercial St., Provincetown, Barnstable, Ma. 02657		
5. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS <small>(Not printers)</small> The Journal Press, 2 Commercial St., Provincetown, Barnstable, Ma. 02657		
6. NAMES AND ADDRESSES OF PUBLISHER, EDITOR, AND MANAGING EDITOR		
PUBLISHER <small>(Name and address)</small> The Journal Press, 2 Commercial St., Provincetown, Barnstable, Ma. 02657		
EDITOR <small>(Name and address)</small> Editorial Board, 2 Commercial St., Provincetown, Barnstable, Ma. 02657		
MANAGER EDITOR <small>(Name and address)</small> Powell Murchison, 2 Commercial St., Provincetown, Barnstable, Ma. 02657		
7. OWNER <small>(If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.)</small>		
NAME	ADDRESS	
The Journal Press	2 Commercial St., Provincetown, Ma. 02657	
Dorotea P. Murchison	2 Commercial St., Provincetown, Ma. 02657	
Powell Murchison	2 Commercial St., Provincetown, Ma. 02657	
8. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES <small>(If there are none, so state)</small>		
NAME	ADDRESS	
Same as above		
9. FOR OPTIONAL COMPLETION BY PUBLISHERS MAILING AT THE REGULAR RATES <small>(Section 132.121, Postal Service Manual)</small>		
39 U. S. C. 3626 provides in pertinent part: "No person who would have been entitled to mail matter under former section 4359 of this title shall mail such matter at the rates provided under this subsection unless he files annually with the Postal Service a written request for permission to mail matter at such rates."		
In accordance with the provisions of this statute, I hereby request permission to mail the publication named in Item 1 at the reduced postage rates presently authorized by 39 U. S. C. 3626.		
<small>(Signature and title of editor, publisher, business manager, or owner)</small> Powell Murchison, Business Manager		
10. FOR COMPLETION BY NONPROFIT ORGANIZATIONS AUTHORIZED TO MAIL AT SPECIAL RATES <small>(Section 132.122, Postal Manual)</small>		
<small>(Check one)</small>		
The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes		
<input type="checkbox"/> Have not changed during preceding 12 months	<input type="checkbox"/> Have changed during preceding 12 months	<small>(If changed, publisher must submit explanation of change with this statement.)</small>
11. EXTENT AND NATURE OF CIRCULATION		
A. TOTAL NO. COPIES PRINTED <small>(Net Press Run)</small>	AVERAGE NO. COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	ACTUAL NUMBER OF COPIES OF SINGLE ISSUE PUBLISHED NEAREST TO FILING DATE
2225	2225	2225
B. PAID CIRCULATION		
1. SALES THROUGH DEALERS AND CARRIERS, STREET VENDORS AND COUNTER SALES	none	none
2. MAIL SUBSCRIPTIONS	1672	1719
C. TOTAL PAID CIRCULATION	1672	1719
D. FREE DISTRIBUTION BY MAIL, CARRIER OR OTHER MEANS		
1. SAMPLES, COMPLIMENTARY, AND OTHER FREE COPIES	29	29
2. COPIES DISTRIBUTED TO NEWS AGENTS, BUT NOT SOLD	none	none
E. TOTAL DISTRIBUTION <small>(Sum of C and D)</small>	1701	1748
F. OFFICE USE, LEFT-OVER, UNACCOUNTED, SPOILED AFTER PRINTING	524	477
G. TOTAL <small>(Sum of E & F—should equal net press run shown in A)</small>	2225	2225
<small>(Signature of editor, publisher, business manager, or owner)</small>		
I certify that the statements made by me above are correct and complete.		
Powell Murchison, Business Manager		

Notice: All copyrighted material reprinted or otherwise reproduced from Journal Press publications should be given an appropriate acknowledgment. No permission is necessary for brief quotations and originally worded abstracts (less than 300-word total or 10 percent of length, whichever is least, for any one article). Written permission is required for reprinting or copying tables, figures, summaries, entire articles, or substantial portions thereof; such permission normally carries a charge of \$5 per page and is contingent upon agreement and possible stipulation of the original author or authors. Estate permission can be required. Authors requesting use of their own material are not charged. Fees may be waived for limited-copy instructional usage and for government periodicals. Special rates can be applied when justified.

The Journal of Psychology

Founded in 1935 by Carl Murchison

The Journal of Psychology was founded at the request of many psychologists throughout the world for the purpose of establishing a medium in which publication shall be immediate and in which other publication experiments may be carried out.

(1). The subscription price is \$39.00 per annum, \$18.00 per volume, \$9.00 per issue (three volumes per year).

(2). Manuscripts may be sent to any member of the Editorial Board or may be sent directly to The Journal Press. The lag in publication should not be more than a few weeks.

(3). The author will receive 200 reprints of his paper, and subscribers will receive the accumulated publications bound into half-volume units. The second half of each volume will contain the title page and table of contents for that volume. Each half-volume unit will be mailed to the subscribers at its stated date.

(4). Each author will be charged the manufacturing costs of any zincs, halftone cuts, tables, or equations. Excessive use of special fonts (references, footnotes, quotations, appendices) will also be charged.

(5). The publication charges are as follows:

1 to 4 pages	.....	\$60.00
5 to 8 "	.....	120.00
9 to 12 "	.....	180.00
13 to 16 "	.....	240.00
17 to 20 "	.....	300.00
21 to 24 "	.....	360.00
25 to 28 "	.....	420.00
29 to 32 "	.....	480.00

These charges are subject to adjustment as justified.

(6). The accumulated units will be mailed to subscribers bimonthly: January, March, May, July, September, and November. The units may vary in size to accommodate publication needs.

All back issues are available. See announcement on inside front cover.

THE JOURNAL PRESS

32 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Library No. 786
Date 2/8/77
Lib
Ednl Pay Rese

Journal of Genetic Psychology

Founded by G. Stanley Hall in 1891; reorganized by Carl Murchison in 1925

Quarterly, beginning with March. Devoted to developmental and clinical psychology, with briefly reported Replications and Refinements and occasional book reviews. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of General Psychology

Founded in 1927 by E. B. Titchener and Carl Murchison

Quarterly, beginning with January. Devoted to experimental, physiological, and comparative psychology, with briefly reported Replications, Refinements, and Comments. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of Social Psychology

Founded in 1929 by John Dewey and Carl Murchison

Bimonthly, beginning with February. Devoted to studies of persons in group settings and of culture and personality; special attention to cross-cultural articles and notes, to field research, and to briefly reported Replications and Refinements. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Three volumes annually. Per annum, \$39.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Each author will receive 100 unbound reprints gratis. Additional reprints may be purchased at a nominal cost when the author returns page-proof.

387
401 812
556
THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Club Rate for Five International Psychological Journals

	PER ANNUM
THE JOURNAL OF GENETIC PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
GENETIC PSYCHOLOGY MONOGRAPHS (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF GENERAL PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF SOCIAL PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
THE JOURNAL OF PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
	<u>TOTAL \$156.00</u>

TEACHERS AND STUDENTS EDITION, *Restricted Sale* \$50.00

The *Teachers and Students Edition* is open to any individual psychologist, teacher, student, or physician but requires an agreement that the edition will not be offered for sale till after five years from publication and an agreement that the edition will not be substituted for an institutional subscription. Write for our Teachers and Students contract card.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Genetic Psychology Monographs

Founded in 1925 by Carl Murchison

Quarterly, beginning with February. Devoted to developmental and clinical psychology. Each number one or more complete researches. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

NOTICE. Effective immediately we offer prior publication for certain selected monographs. Charges will be based on the announced rates for The Journal of Psychology. Regular monographs will carry no page charge for the first 50 pages, but for all pages above 50 there will be a charge of \$10.00 per page. Manufacturing costs of any zincs, halftone cuts, tables, or equations will be charged to authors, as will excessive use of special fonts. Two hundred reprints of each monograph will be supplied free of charge.

The listing of monographs for 1926 through 1963 will be printed in the first half of each volume of all five journals. Monographs published after 1963 will be listed in the second half of each volume.

Genetic Psychology Monographs (continued)

VOLUME 1—1926

1. Performance tests for children of pre-school age—R. STUTSMAN
2. An experimental study of the eidetic type—H. KLÜVER
- 3 & 4. A study of natio-racial mental differences—N. D. M. HIRSCH
5. A psychological study of juvenile delinquency by group methods—J. W. BRIDGES AND K. M. B. BRIDGES
6. The influence of puberty praecox upon mental growth—A. GESELL

VOLUME 2—1927

- 1 & 2. The mind of a gorilla—R. M. YERKES
3. The role of eye-muscles and mouth-muscles in the expression of the emotions—K. DUNLAP
4. Family similarities in mental-test abilities—R. R. WILLOUGHBY
5. Coordination in the locomotion of infants—L. H. BURNSIDE
6. The mind of a gorilla: Part II. Mental development—R. M. YERKES

VOLUME 3—January-June, 1928

1. An experimental study of the olfactory sensitivity of the white rat—J. R. LIGGETT
2. A photographic study of eye movements in reading formulae—M. A. TINKER
3. An experimental study of the East Kentucky mountaineers—N. D. M. HIRSCH
4. Responses of foetal guinea pigs prematurely delivered—G. T. AVERY
5. Objective differentiation between three groups in education (teachers, research workers, and administrators)—M. B. JENSEN
6. The effect of segregation on the sex behavior of the white rat as measured by the obstruction method—M. JENSEN

VOLUME 4—July-December, 1928

1. Observation and training of fundamental habits in young children—E. A. BOTT, W. E. BLATZ, N. CHANT, H. BOTT
- 2 & 3. Determination of a content of the course in literature of a suitable difficulty for junior and senior high school students—M. C. BURCH
- 4 & 5. Methods for diagnosis and treatment of cases of reading disability—M. MONROE
6. The relative effectiveness of lecture and individual reading as methods of college teaching—E. B. GREENE

VOLUME 5—January-June, 1929

1. The age factor in animal learning: I. Rats in the problem box and the maze—C. P. STONE
2. The effect of delayed incentive on the hunger drive in the white rat—E. L. HAMILTON
3. Which hand is the eye of the blind?—J. M. SMITH
4. The effect of attitude on free word association-time—A. G. EKDAHL
5. The localization of tactual space: A study of average and constant errors under different types of localization—L. E. COLE
6. The effects of gonadectomy, vasotomy, and injections of placental and orchic extracts on the sex behavior of the white rat—H. W. NISSEN

VOLUME 6—July-December, 1929

1. Learning and growth in identical infant twins: An experimental study by the method of co-twin control—GESELL AND H. THOMPSON
2. The age factor in animal learning: II. Rats on a multiple light discrimination box and a difficult maze—C. P. STONE
3. The acquisition and interference of motor habits in young children—E. MCGINNIS
4. A vocational and socio-educational survey of graduates and non-graduates of small high schools of New England—A. D. MUELLER
- 5 & 6. A study of the smiling and laughing of infants in the first year of life—R. W. WASHBURN

VOLUME 7—January-June, 1930

1. Tensions and emotional factors in reaction—E. DUFFY
2. Teacher influence on class achievement: A study of the relationship of estimated teaching ability to pupil achievement in reading and arithmetic—H. R. TAYLOR
- 3 & 4. A study of the effect of inverted retinal stimulation upon spatially coordinated behavior—P. H. EWERT
5. A study of the mental development of children with lesion in the central nervous system—E. E. LORD
6. An experimental study upon three hundred school children over a six-year period—N. D. M. HIRSCH

VOLUME 8—July-December, 1930

1. The amount and nature of activities of newborn infants under constant external stimulating conditions during first ten days of life—O. C. IRWIN
2. Race and social differences in performance tests—S. D. PORTEUS, *et al.*
3. Language and growth: The relative efficacy of early and deferred vocabulary training, studied by the method of co-twin control—L. C. STRAYER
4. Eye-movements and optic nystagmus in early infancy—J. M. MCGINNIS
- 5 & 6. Reactions of kindergarten, first-, and second-grade children to constructive play materials—L. FARWELL

VOLUME 9—January-June, 1931

- 1 & 2. The status of the first-born with special reference to intelligence—H. H. HSIAO
- 3 & 4. An experimental study of bright, average, and dull children at the four-year mental level—H. P. DAVIDSON
5. An historical, critical, and experimental study of the Seashore-Kwalwasser test battery—P. R. FARNSWORTH
6. A comparison of difficulty and improvement in the learning of bright and dull children in reproducing a description—F. T. WILSON

VOLUME 10—July-December, 1931

1. A comparative study of a group of southern white and negro infants—M. B. MCGRAW
- 2 & 3. An experimental study of prehension in infants by means of systematic cinema records—H. M. HALVERSON
4. The limits of learning ability in kittens—A. M. SHUEY
- 5 & 6. The effect of habit interference upon performance in maze learning—O. W. ALM

VOLUME 11—January-June, 1932

1. General factors in transfer of training in the white rat—T. A. JACKSON
2. The effect of color on visual apprehension and perception—M. A. TINKER
3. The reliability and validity of maze experiments with white rats—R. LEEPER
4. A critical study of two lists of best books for children—F. K. SHUTTLEWORTH
- 5 & 6. Measuring human energy cost in industry: A general guide to the literature—R. M. PAGE

VOLUME 12—July-December, 1932

1. Family resemblances in verbal and numerical abilities—H. D. CARTER
2. The development of fine prehension in infancy—B. M. CASTNER
- 3 & 4. The growth of adaptive behavior in infants: An experimental study at seven age levels—H. M. RICHARDSON
- 5 & 6. Differential reactions to taste and temperature stimuli in newborn infants—K. JENSEN

VOLUME 13—January-June, 1933

1. A critique of sublimation in males: A study of forty superior single men—W. S. KOYER
2. A study of the nature, measurement, and determination of hand preference—H. L. KACH, *et al.*
3. The growth and decline of intelligence: A study of a homogeneous group between the ages of ten and sixty—H. JONES AND H. S. CONRAD
4. The relation between the complexity of the habit to be acquired and the form of the learning curve in young children—M. L. MATTSON
5. Eating habits in relation to personality development of two- and three-year-old children: A study of sixty children in two nursery schools—A. A. ELIOT
6. Coordinating mechanisms of the spinal cord—O. C. INGEBRITSEN

Genetic Psychology Monographs (continued)

VOLUME 14—July-December, 1933

1. Mental growth during the first three years: A developmental study of sixty-one children by repeated tests—N. BAYLEY
2. A study of triplets: including theories of their possible genetic relationships—F. N. ANDERSON AND N. V. SCHEIDEMANN
3. The objective measurement of emotional reactions—H. V. GASKILL
4. Development of behavior in the fetal cat—J. D. CORONIOS
5. A study of certain language developments of children in grades four to twelve, inclusive—L. L. LABRANT
6. The effect of early and delayed practice on memory and motor performances studied by the method of co-twin control—J. R. HILGARD

VOLUME 15—January-June, 1934

1. Studies in the psychology of tone and music—P. R. FARNSWORTH
2. Motor learning of children in equilibrium in relation to nutrition—E. L. BEEBE
3. Discrimination limens of pattern and size in the goldfish *Carassius auratus*—J. B. ROWLEY
4. Limits of learning ability in the white rat and the guinea pig—B. F. RIESS
5. The limits of learning ability in rhesus monkeys—H. A. FIELD

VOLUME 16—July-December, 1934

1. A statistical study of ratings on the California Behavior Inventory for Nursery-School Children—H. S. CONRAD
2. An eye-movement study of objective examination questions—A. FRANDSEN
3. An experimental study of constitutional types—O. KLINEBERG, S. E. ASCH, AND H. BLOCK
4. The development of a battery of objective group tests of manual laterality, with the results of their application to 1300 children—W. N. DUROST
5. & 6. An experimental study in the prenatal guinea-pig of the origin and development of reflexes and patterns of behavior in relation to the stimulation of specific receptor areas during the period of active fetal life—L. GARMICHAEL

VOLUME 17—January-December, 1935

1. Organization of behavior in the albino rat—R. L. THORNDIKE
2. Brightness discrimination in the rhesus monkey—M. P. CRAWFORD
3. The limits of learning ability in cebus monkeys—A. M. KOCH
4. Nature-nurture and intelligence—A. M. LEAHY
5. On intelligence of epileptic children—E. B. SULLIVAN AND L. CAHAGAN
6. A study of the play of children of preschool age by an unobserved observer—D. L. COCKRELL

VOLUME 18—January-December, 1936

1. Sex differences in variational tendency—Q. McNEMAR AND L. M. TERMAN
2. The process of learning to dress among nursery-school children—C. B. KEY, M. R. WHITE, M. P. HONZIK, A. B. HEINEY, AND D. ERWIN
3. A study of the present social status of a group of adults, who, when they were in elementary schools, were classified as mentally deficient—W. R. BALLER
4. The influence of specific experience upon mental organizations—A. ANASTASI
5. & 6. Studies in aggressiveness—L. BENDER, S. KEISER, AND P. SCHILDER

VOLUME 19—January-December, 1937

1. Psychological bases of self-mutilation—C. DABROWSKI
2. Masculine temperament and secondary sex characteristics: A study of the relationship between psychological and physical measures of masculinity—H. GILKINSON
3. A psychological study of forty unmarried mothers—R. D. NOTTINGHAM
4. Behavior problems in the children of psychotic and criminal parents—L. BENDER
5. Domination and integration in the social behavior of young children in an experimental play situation—H. H. ANDERSON
6. The sequential patterning of prone progression in the human infant—L. B. AMES

VOLUME 20—January-December, 1938

1. The relationship between characteristics of personality and physique in adolescents—P. S. DE Q. CAROT
2. Behavior problems of elementary school children: A descriptive and comparative study—I. Y. MASTEN
3. Graphic representation of a man by four-year-old children in nine prescribed drawing situations—P. F. GRIDLEY
4. Differences between two groups of adult criminals—R. S. TOLMAN
5. A comparative study by means of the Rorschach method of personality development in twenty pairs of identical twins—E. TROUP
6. Individual differences in the facial expressive behavior of preschool children: A study by the time-sampling method—C. SWAN

VOLUME 21—January-December, 1939

1. An experimental analysis of "level of aspiration"—R. GOULD
2. Some light on the problem of bilingualism as found from a study of the progress in mastery of English among preschool children of non-American ancestry in Hawaii—M. E. SMITH
3. Domination and social integration in the behavior of kindergarten children and teachers—H. H. ANDERSON
4. The capacity of the rhesus and cebus monkey and the gibbon to acquire differential response to complex visual stimuli—W. E. GALT
5. The social-sex development of children—E. H. CAMPBELL

VOLUME 22—January-December, 1940

1. Measuring human relations: An introduction to the study of the interaction of individuals—E. D. CHAPPLE
2. Aggressive behavior in young children and children's attitudes toward aggression—M. D. FITE
3. Student attitudes toward religion—E. NELSON
4. The prediction of the outcome-on-furlough of dementia praecox patients—J. S. JACOB
5. Significant characteristics of preschool children as located in the Conrad inventory—K. H. READ
6. Learning by children at noon-meal in a nursery school: Ten "good" eaters and ten "poor" eaters—J. B. MCCAY, E. B. WAKING, AND P. J. KRUSE

VOLUME 23—January-June, 1941

1. An analysis of certain variables in a developmental study of language—F. M. YOUNG
2. Infant development under conditions of restricted practice and of minimum social stimulation—W. DENNIS
3. An analysis of the mental factors of various age groups from nine to sixty—B. BALINSKY
4. Factors influencing performance on group and individual tests of intelligence: I. Rate of work—M. W. BENNETT
5. Individual differences in apperceptive reaction: A study of the response of preschool children to pictures—E. W. AMEN

VOLUME 24—July-December, 1941

1. Twins T and C from infancy to adolescence: A biogenetic study of individual differences by the method of co-twin control—A. GESELL AND H. THOMPSON
2. Finger nail-biting: Its incipency, incidence, and amelioration—A. L. BILLIG
3. An experimental study of the factors of maturation and practice in the behavioral development of the embryo of the frog, *Rana pipiens*—A. FROMME
4. The Fels child behavior scales—T. W. RICHARDS AND M. P. SIMONS
5. Measurement of the size of general English vocabulary through the elementary grades and high school—M. K. SMITH
6. Stereotypes in the field of musical eminence—P. R. FARNSWORTH

VOLUME 25—January-June, 1942

1. A study of factors determining family size in a selected professional group—J. C. FLANAGAN
2. A genetic study of geometrical-optical illusions—A. WALTERS
3. Interpretation of behavior-ratings in terms of favorable and unfavorable deviations: A study of scores from the Read-Conrad Behavior Inventory—K. H. READ AND H. S. CONRAD
4. Are there any innate behavior tendencies?—J. B. SCHOOLLAND
5. An investigation of the intelligibility of the speech of the deaf—C. V. HUDCINS AND F. C. NUMBERS

Genetic Psychology Monographs (continued)

VOLUME 26—July-December, 1942

1. The critical frequency limen for visual flicker in children between the ages of 6 and 18—V. L. MILLER
2. Some factors determining handedness in the white rat—K. L. WENTWORTH
3. Motivation and behavior—E. FRENKEL-BRUNSWIK

VOLUME 27—January-June, 1943

1. Comparison of children's personality traits, attitudes, and intelligence with parental occupation—N. R. MADDOY
2. A comparative study of mental functioning patterns of problem and non-problem children seven, eight, and nine years of age—M. L. PIGNATELLI

VOLUME 28—July-December, 1943

1. Separation anxiety in young children: A study of hospital cases—H. EDELSTON
2. Correlates of vocational preferences—W. A. BRADLEY, JR.

VOLUME 29—January-June, 1944

1. Mental changes after bilateral prefrontal lobotomy—S. D. PORTEUS AND R. D. KEPNER
2. A twin-controlled experiment on the learning of auxiliary languages—B. PRICE, W. J. KOSTIR, AND W. M. TAYLOR

VOLUME 30—July-December, 1944

1. A method of administering and evaluating the thematic appreciation test in group situations—R. M. CLARK
2. A study of anxiety reactions in young children by means of a projective technique—R. TEMPLE AND E. W. AMEN

VOLUME 31—January-June, 1945

1. The evolution of intelligent behavior in rhesus monkeys—B. WEINSTEIN
2. Perceptual behavior of brain-injured, mentally defective children: An experimental study by means of the Rorschach technique—H. WERNER

VOLUME 32—July-December, 1945

1. A clinical study of sentiments: I.—H. A. MURRAY AND C. D. MORGAN
2. A clinical study of sentiments: II.—H. A. MURRAY AND C. D. MORGAN

VOLUME 33—January-June, 1946

1. Interpretation of spontaneous drawings and paintings—T. S. WAERNER
2. Preferences for sex symbols and their personality correlates—K. FRANCK
3. Outstanding traits: In a selected college group, with some reference to career interests and war records—F. L. WELLS AND W. L. WOODS

VOLUME 34—July-December, 1946

1. The relation of emotional adjustment to intellectual function—J. L. DESPERT AND H. O. PIERCE
2. The smiling response: A contribution to the ontogenesis of social relations—R. A. SPITZ
3. Finger-painting and personality diagnosis—P. J. NAPOLI

VOLUME 35—January-June, 1947

1. The thematic apperception technique in the study of culture-personality relations—W. E. HENRY
2. A continuation study of anxiety reactions in young children by means of a projective technique—M. DORKEY AND E. W. AMEN

A study of the vocational interest trends of secondary school and college women—A. M. CAWLEY

VOLUME 36—July-December, 1947

1. Maze test validation and psychosurgery—S. D. PORTEUS AND H. N. PETERS
2. The diagnostic implications of Rorschach's test in case studies of mental defectives—I. JOLLES

VOLUME 37—January-June, 1948

1. The radio day time serial: A symbolic analysis—W. L. WARNER AND W. E. HENRY
2. The relation of personality characteristics and response to verbal approval in a learning task—G. L. GRACE
3. The mechanism of vision: XVIII. Effects of destroying the visual "associative areas" of the monkey—K. S. LASHLEY
4. A study of the relationship between handwriting and personality variables—P. CASTELNUOVA-TEDESCO

VOLUME 38—July-December, 1948

1. Modern language learning: The intensive course as sponsored by the United States Army, and implications for the undergraduate course of study—M. LING
2. Conflict: A study of some interactions between appetite and aversion in the white rat—M. A. TOLCOTT
3. Schizophrenia and the MAPS test: A study of certain formal psycho-social aspects of fantasy production in schizophrenia as revealed by performance on the Make a Picture Story (MAPS) Test—E. S. SHNEIDMAN
4. A study of the transmission of authority patterns in the family—H. L. INGERSOLL

VOLUME 39—January-June, 1949

1. A study of the psychoanalytic theory of psychosexual development—G. S. BLUM
2. The assessment of parental attitudes in relation to child adjustment—E. J. SHOEN, JR.
3. Qualitative differences in the vocabulary responses of normals and abnormals—H. FEIFEL
4. The relative effectiveness of motion and still pictures as stimuli for eliciting fantasy stories about adolescent-parent relationships—P. E. EISERER
5. The organization of hereditary maze-brightness and maze-dullness—L. V. SEARLE

VOLUME 40—July-December, 1949

1. An experimental study of what young school children expect from their teachers—B. BIBER AND C. LEWIS
2. A study of the relative effects of age and of test difficulty upon factor patterns—H. A. CURTIS
3. A projective experiment using incomplete stories with multiple choice endings—J. K. SEATON
4. Effects of sex role and social status on the early adolescent personality—E. MILNER
5. Social perceptions and attitudes of children—M. RADKE, H. TRAGER, AND H. DAVIS

VOLUME 41—January-June, 1950

1. Some psychological and educational aspects of pediatric practice: A study of well-baby clinics—L. H. BLUM
2. One-trial learning in the domestic rat—B. B. HUDSON
3. An introduction to the principles of scientific psychoanalysis—A. ELLIS
4. Awareness of racial differences by preschool children in Hawaii—D. V. SPRINGER
5. Age trends in children's evaluation of teacher-approved and teacher-disapproved behavior—S. L. WITRYOL
6. The relationship between level of vocational aspiration and certain personal data: A study of some traits and influences bearing on the prestige level of vocational choice—J. STUBBINS

VOLUME 42—July-December, 1950

1. Personality patterns of suicidal mental hospital patients—N. L. FARRERROW
2. Sex-role identification in young children in two diverse social groups—M. RABBAN
3. A study of the influence of the social field on individual behavior: As revealed in the expression of hostility and warmth by neurotics and paranoid schizophrenics in discussion group situations—D. SHAPIRO
4. An experimental study of avoidance—R. F. HEFFERLINE

VOLUME 43—January-June, 1951

1. A study of copying ability in children—E. A. TOWNSEND
2. Prestige motivation of gifted children—D. P. AUSUBEL
3. A psychological study of physical scientists—A. ROE

VOLUME 44—July-December, 1951

1. The organization of hostility controls in various personality structures—S. FISHER AND E. HINDS
2. Children and radio: A study of listeners and non-listeners to various types of radio programs in terms of selectability, attitude, and behavior measures—E. A. RICCIUTI
3. Quantitative expression in young children—W. E. MARTIN
4. The use of magnetic devices in the collection and analysis of the preverbal utterances of an infant—A. W. LYNIF

VOLUME 45—January-June, 1952

1. Japanese-American personality and acculturation—W. CAUDILL
2. A statistical study of the Freudian theory of levels of psychosexual development—C. A. BARNES
3. Personality characteristics of selected disability groups—D. N. WIENER

Genetic Psychology Monographs (continued)

VOLUME 46—July-December, 1952

1. The relationship of social status, intelligence, and sex of ten- and eleven-year-old children to an awareness of poverty—F. J. ESTYAN
An empirical study of the castration and Oedipus complexes—S. M. FRIEDMAN
2. The relationship between projective test scoring categories and activity preferences—M. M. SCHWARTZ
A comparison of formal and content factors in the diagnostic testing of schizophrenia—M. SHERMAN

VOLUME 47—January-June, 1953

1. Ability and accomplishment of persons earlier judged mentally deficient—D. C. CHARLES
Variations in the consistency of the behavioral meaning of personality test scores—M. KORNREICH
2. Some child-rearing antecedents of aggression and dependency in young children—R. R. SEARS, *et al.*
Symptom correlates for descriptive diagnosis—J. R. WITTENBORN, *et al.*

VOLUME 48—July-December, 1953

1. Age and mental abilities: A longitudinal study—W. A. OWENS, JR.
The development of a personality questionnaire for drinkers—P. J. HAMPTON
Personality and physical disease: A test of the Dunbar hypothesis applied to diabetes mellitus and rheumatic fever—D. H. CROWELL
2. Socio-economic contrasts in children's peer culture prestige values—B. POPE
A critical review of the stability of social acceptability scores obtained with the partial-rank-order and the paired-comparison scales—S. A. WITRYOL AND G. G. THOMPSON
A study of the effects of color on Rorschach responses—G. G. BRODY

VOLUME 49—January-June, 1954

1. Factors underlying major reading disabilities at the college level—J. A. HOLMES
Parent behavior toward first and second children—J. K. LASKO
2. Social-status and intelligence: An experimental study of certain cultural determinants of measured intelligence—E. A. HAGGARD
Certain determinants and correlates of authoritarianism—S. SIEGEL

Personalities in faces: I. An experiment in social perceiving—P. F. SECORD, W. F. DUKES, AND W. BEVAN
VOLUME 50—July-December, 1954

1. A study of the relationship between play patterns and anxiety in young children—E. W. AMEN AND N. RENISON
Operational exploration of the conceptual self system and of the interaction between frames of reference—M. EDELSON AND A. E. JONES
Problem solving: A statistical description of some relationships between organismic factors and selected response measures—N. A. FATTU, E. KAPOS, AND E. V. MECH
2. The relation of cortical potentials to perceptual functions—C. CHYATTE
The import for clinical psychology of the use of tests derived from theories about infantile sexuality and adult character—D. W. MILES
Measuring personality in developmental terms: The Personal Preference Scale—M. H. KROUT AND J. K. TABIN

VOLUME 51—January-June, 1955

1. Some relations between techniques of feeding and training during infancy and certain behavior in childhood—A. BERNSTEIN
The expression of personality in drawings and paintings—L. H. STEWART
2. Negative stereotypes concerning Americans among American-born children receiving various types of minority-group education—J. A. FISHMAN
The Lincoln-Oseretsky Motor Development Scale—W. SLOAN

VOLUME 52—July-December, 1955

1. Some personality correlates of sex, sibling position, and sex of sibling among five- and six-year-old children—H. L. KOCH
A quantitative Rorschach assessment of maladjustment and rigidity in acculturating Japanese Americans—G. DEVOS
Measurement of authoritarianism and its relation to teachers' classroom behavior—H. M. MCGEE
2. The formal aspects of schizophrenic verbal communication—B. MIRIN
A study in an aspect of concept formation, with subnormal, average, and superior adolescents—H. N. HOFFMAN
Traumatic avoidance learning: Acquisition and extinction in dogs deprived of normal peripheral autonomic function—L. C. WYNN AND R. L. SOLOMON

VOLUME 53—January-June, 1956

1. As the psychiatric aide sees his work and problems—F. L. WELLS, M. GREENBLATT, AND R. W. HYDE
An investigation of avoidance, anxiety, and escape behavior in human subjects as measured by action potentials in muscle—J. D. BROTHERS
Spread of effect: A critical review—M. H. MARX
2. Stress, fantasy, and schizophrenia: A study of the adaptive processes—O. J. B. KERNER
The attitude structure of the individual: A Q-study of the educational attitudes of professors and laymen—F. N. KERLINGER

VOLUME 54—July-December 1956

1. A study of personality differences between middle and lower class adolescents: The Sondi Test in culture-personality research—L. RAINWATER
The assessment of parental identification—S. W. GRAY AND R. KLAUS
2. The influence of social context on impulse and control tendencies in preadolescents—G. H. ZUK
Tender-mindedness versus tough-mindedness in psychology: A reexamination—H. WINTHROP
A method for the comparison of groups: A study in thematic apperception—L. C. SCHAW AND W. E. HENRY

VOLUME 55—January-June, 1957

1. Academic performance and personality adjustments of highly intelligent college students—B. M. HORRALL
The use of the Vineland Social Maturity Scale in the planning of an educational program for non-institutionalized low-grade mentally deficient children—M. G. GOTTSCHEN
2. The structure and origin of the anal character—H. BELOFF
Free expression of adolescents' interests—M. AMATORA
The role of mass media and the effect of aggressive film content upon children's aggressive responses and identification choices—R. S. ALBERT

Interest in persons as an aspect of sex difference in the early years—E. W. GOODENOUGH

VOLUME 56—July-December, 1957

1. Some stable response determinants of perception, thinking, and learning: A study based on the analysis of a single test—M. L. SIMMEL AND S. COUNTS
Potentials of age: An exploratory field study—S. L. PRESSEY
2. Tactile communication—L. K. FRANK
The use of a filmed puppet show as a group projective technique for children—M. R. HAWORTH
The social competence of middle-aged people—R. J. HAVIGHURST

VOLUME 57—January-June, 1958

1. Psychological and cultural problems in mental subnormality: A review of research—S. B. SARASON AND T. GLADWIN
Developmental aspects of discrimination in relation to adjustment—P. LONDON
2. Muscular tension as a response to psychological stress in rheumatoid arthritis and peptic ulcer—J. A. SOUTHWORTH
Frustration: Theory and experiment—R. LAWSON AND M. H. MARX

VOLUME 58—July-December, 1958

1. Emotional aspects of political behavior: The woman voter—E. M. BENNETT AND H. M. GOODWIN
The accuracy of self estimate: A measure of self-concept reality—R. M. BRANDT
Personality factors in social mobility: A study of occupationally mobile businessmen—J. C. ABBEGLLEN
2. Interaction between authoritarian and nonauthoritarian principals and teachers—P. LAMBERT
Some factors related to the choice-status of ninety eighth-grade children in a school society—D. ELKINS
Some relationships between fantasy and self-report behavior—R. C. CALOGERAS

Genetic Psychology Monographs (continued)

VOLUME 59—January-June, 1959

1. Freshman Rorschachs and college performance—G. R. SCHMIDLER, M. J. NELSON, AND M. BRISTOL
Perceptual aspects of attributed movement—R. W. COAN
Men and women: Personality patterns and contrasts—E. M. BENNETT AND L. R. COHEN
2. Personality factors in mothers of cerebral palsied children—G. BOLLES
Separatism and integrationism: A social-psychological analysis of editorial content in New York newspapers of the American minority groups—J. A. FISHMAN AND G. S. FISHMAN
Self, role, and satisfaction—A. L. BROPHY

VOLUME 60—July-December, 1959

1. The constancy of personality ratings over two decades—R. D. TUDDENHAM
Mother-son identification and vocational interest—L. H. STEWART
A study of mother-child relationships in the emotional disorders of children—M. J. ROSENTHAL, M. FINKELSTEIN, NI, AND R. E. ROBERTSON
On the trail of the wolf-children—W. F. OGBURN AND N. K. BOSE
2. Measuring the mental health of normal adults—R. F. PECK
Parental identification in young children—W. EMMERICH
The problems of Jewish religious youth—B. M. LEVINSON

VOLUME 61—January-June, 1960

1. Identifying socially maladjusted school children—A. A. ADAMS
Social interaction in an interracial nursery school—H. W. STEVENSON AND N. G. STEVENSON, *et al.*
Interests of pre-adolescent boys and girls—M. AMATORA
Educational and sex differences in the organization of abilities in technical and academic students in Colombia, So America—J. F. FILELLA
2. Some themes in the personalities of German men—L. RAINWATER
Right-left gradients in body image, body reactivity, and perception—S. FISHER
Longitudinal survey of child Rorschach responses: Younger subjects two to 10 years—L. B. AMES
Personality patterns related to occupational roles—M. SIEGELMAN AND R. F. PECK

VOLUME 62—July-December, 1960

1. The reading process: A descriptive, interdisciplinary approach—M. P. LANGMAN
Reactions to stress as a function of the level of intelligence—S. M. H. ZAIDI
Rorschach diagnosis by a systematic combining of content, thought process, and determinant scales—P. A. BOWEN, R. TESTIN, AND A. ROBERTS
Longitudinal survey of child Rorschach responses: Older subjects aged 10 to 16 years—L. B. AMES
2. Twenty years of shock therapy in America, 1937-1956: An annotated bibliography—N. H. PRONKO, R. SITTERLY, K. BEGG
The quantitative analysis of parent behavior toward psychotic children and their siblings—E. M. DONNELLY

VOLUME 63—January-June, 1961

1. Make a sentence test: An approach to objective scoring of sentence completions—E. F. BORGATTA
Some aspects of the relationship between perception and motility in children—E. P. ROTHMAN
Some psychophysical aspects of mental illness in children—P. H. BERKOWITZ
Conceptual thinking in schizophrenic children—G. FRIEDMAN
2. Some maternal influences on children's personality and character—J. C. FINNEY
A study of concept formation in normals, mental defectives, and brain-damaged adults—R. W. ZASLOW
An investigation of trait relationships among six-year-old children—S. A. AVAKIAN

VOLUME 64—July-December, 1961

1. Coping patterns of preschool children in response to intelligence test demands—A. MORIARTY
Studies of individual and paired interactional problem-solving behavior of rats: II. Solitary and social control—A. BARON AND R. A. LITTMAN
2. Studies of role performance—J. H. MANN
A psychological assessment of professional actors and related professions—R. TAFT
A cross-cultural study of menstrual taboos—W. N. STEPHENS
The biological roots of creativity—H. GUTMAN

VOLUME 65—January-June, 1962

1. A Rorschach study of the development of personality structure in white and Negro children in a Southeastern community—A. C. PRICE
Measuring personality patterns of women—J. LOEWINGER
Home interests in early adolescence—M. AMATORA
Social and emotional adjustment during adolescence as related to the development of psychosomatic illness in adulthood—L. H. STEWART
2. A systematic study of interaction process scores, peer and self-assessments, personality and other variables—E. BORGATTA
Children's conceptions of the content and functions of the human body—E. GELLERT

VOLUME 66—July-December, 1962

1. Oculer-manual laterality and perceptual rotation of literal symbols—I. FLESCHER
Parental child-rearing attitudes and their correlates in adolescent hostility—S. B. CHOROST
Some explorations into the nature of anxieties relating to illness—P. R. ROBBINS
Developmental-interactive aspects of hypnosis: Some illustrative cases—J. R. HILGARD AND E. R. HILGARD
2. Teaching a two-year-old to read: An experiment in early childhood learning—W. FOWLER
Achievement gains or losses during the academic year and over the summer vacation period: A study of trends in achievement by sex and grade level among students of average intelligence—K. M. PARSLEY, JR., AND M. POWELL

VOLUME 67—January-June, 1963

1. Verbatim dialogue of a mother and child in therapy—C. E. MOUSTAKAS
A study of self-concept: Delinquent boys' accuracy in selected self-evaluations—W. E. AMOS
An integrating study of the factor structure of adult attitude-interests—R. B. CATTELL AND J. HORN
Social factors in mental disorders: A contribution to the etiology of mental illness—W. G. COBLINER
2. Conceptual preferences associated with choice of quantitative and nonquantitative college majors—J. GILBERT
A study of the concept of the feminine role of 51 middle-class American families—A. STEINMANN

VOLUME 68—July-December, 1963

1. Brain dynamism as reflected in illusions—G. K. YACOREYNSKI
The nature and measurement of components of motivation—R. B. CATTELL, J. A. RADCLIFFE, AND A. B. SWENKY
2. Sharing in preschool children as a function of amount and type of reinforcement—W. F. FISCHER
The Gesell Incomplete Man Test as a measure of developmental status—L. B. AMES AND F. L. ILC
Psychological and sociological factors in prediction of career patterns of women—M. C. MULVEY
Functionalism and its historical significance—R. HARRISON

PUBLICATION IN THE JOURNAL OF PSYCHOLOGY

The Journal of Psychology provides a special service to authors and readers. Articles accepted for publication appear in print with the least possible delay. Although editorial standards are the same as those for the other journals, all correspondence and handling are expedited, and the referees may, at their discretion, permit some latitude in length of treatment with respect to tabular material, discussion, and review of the literature.

To save time, authors are requested to exercise unusual care in preparing their papers. Special attention should be paid to the General Instructions on the back cover of each issue and to the announcement on the first preliminary page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

January, 1974
Volume 86, First Half

(Founded in 1935 by Carl Murchison)

The Journal of PSYCHOLOGY

The General Field of Psychology

If this space should be unstamped, this is the regular library edition. But if this space is stamped with a designating title, this is a special edition, sold under the

restrictions of a bilateral contract, and may not be resold for a period of five years from the date of publication.

JANUARY, 1974

(Manuscripts are printed in the order of final acceptance)

A study of Ausubel's proactive hypothesis	3
BY KATHLEEN M. WULF	
Relationship of life style and interpersonal need orientation	13
BY NICHOLAS J. DI MARCO AND PHILIP L. KAPNICK	
Persuasive effects of early and late mention of credible and noncredible sources	17
BY CHARLES D. WARD AND ELLIOTT MCGINNIES	
Empirical validation of Erikson's theory of identity crises in late adolescence	25
BY PATRICIA A. STARK AND ANTHONY J. TRAXLER	
Adolescent self-esteem, family communication, and marital satisfaction	35
BY ROBERTA MATTESON	

(OVER)

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02657

Correlations among women's views of contraception, anxiety, creativity, and equalitarian measures	49
BY JOAN JOESTING AND ROBERT JOESTING	
Career salience as a moderator of the relationship between satisfaction with occupational preference and satisfaction with life in general	53
BY JEFFREY H. GREENHAUS	
Effects of a competitive endurance training program on self-concept and peer approval	57
BY ROBERT W. MCGOWAN, BOYD O. JARMAN, AND DARIL M. PEDERSEN	
Nonverbal rigidity and its relationship to performance on three standard reversible figures	61
BY LOUIS H. PRIMAVERA, WILLIAM E. SIMON, AND SIDNEY H. HOCHMAN	
Conservation and reading achievement of second grade bilingual American Indian Children	65
BY BEVERLY BREKKE AND JOHN D. WILLIAMS	
Parental expectations of psychotherapy	71
BY STEVEN L. WEISS AND ERIC L. DLUGOKINSKI	
Relative contributions of different sources of variance to confidence ratings	81
BY BO EKEHAMMAR AND DAVID MAGNUSSON	
Dogmatism, attitude extremity, and attitude intensity as determinants of perceptual displacement	87
BY DAVID V. STIMPSON AND JOANNE D'ALO	
The effects of negative affect conditions and concept involvement on language redundancy	93
BY RICHARD L. CONVILE AND VERNON E. CRONEN	
The relationship of political orientation to the values of freedom and equality	105
BY DANIEL J. MUELLER	
The effect of contingent shock (punishment) on the performance of a paired-associates learning task	111
BY JERRY W. THORNTON AND GEORGE D. POWELL	
Subject sensitivity to color in estimation of dot frequency for samples of color normal and color defective males	115
BY E. P. HORNE AND WAYNE K. LINDER	
The effects of modeling and instructions on creative responses	123
BY MARY B. HARRIS AND ROBERT C. EVANS	
Picture recognition by preschool children	131
BY FRANKLIN M. BERRY, RONALD JUDAH, AND EDWARD M. DUNCAN	
Verbal discrimination task performance as a function of self <i>versus</i> external reinforcement, I-E scale performance, and subject <i>versus</i> experimenter determination of response	139
BY JOHN J. UNMACHT AND FREDERICK W. OBITZ	
The relationships among professional performance ratings, clinical decisions, and clinical outcomes in psychiatry	149
BY W. R. TAYLOR, D. E. BROWN, JR., DARREL EDWARDS, AND E. K. ERIC GUNDERSON	
Sex roles, task competence, and conformity	157
BY CARLOS GOLDBERG	
The General Survey: A short measure of five personality dimensions	165
BY HERBERT M. KRITZER, A. PAUL HARE, AND HERBERT H. BLUMBERG	
A preliminary note on the motive to avoid success and the menstrual cycle	173
BY ROSEMARIE ANDERSON PATTY AND MARCIA M. FERRELL	

A STUDY OF AUSUBEL'S PROACTIVE HYPOTHESIS*¹

The University of Southern California

KATHLEEN M. WULF²

SUMMARY

Using Ausubel's three-group randomized design, this study investigated possible proactive facilitation of learning similar and conflicting material by eighth grade subjects. One group read a proactive passage once, another read a proactive passage twice, and a control group read an irrelevant passage. All groups read the lesson and were tested in immediate and delayed sessions. Neither learning nor overlearning the proactive passage induced facilitation or interference in learning and retaining the lesson. Subtest scores on five test items considered most facilitating failed to show a significant difference on analysis of variance for immediate and delayed tests. It was concluded that the specific proactive effect, if it exists, is undetected among the effects of manifold variables, including previous lifetime learning, affecting any current learning and retention of meaningful material.

A. INTRODUCTION

Meaningful learning theory as proposed by Ausubel is characterized by the use of a learning "set" to incorporate potentially meaningful material within the individual's cognitive structure. This theory is of particular interest to educational research, since many of the generalizations concerning proactive facilitation from transfer learning theory are not substantiated when meaningful material is the topic (21, p. 142). The purpose of this study was to investigate the relation of proaction and meaningful learning theory, in part replicating Ausubel's initial inconclusive findings.

Two criteria are employed to determine whether new learning is potentially meaningful: nonarbitrary relatability to relevant concepts in cognitive struc-

* Received in the Editorial Office on September 5, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research is adapted from the author's Doctoral dissertation at the University of Southern California. The author gratefully acknowledges the help of C. E. Meyers in the development of the study.

² Requests for reprints should be sent to the author at the address shown at the end of this article.

ture as a characteristic of the material, and the material's relatability to the particular cognitive structure of the learner (2, p. 23). It is on this basis that the potential meaningfulness of learning material varies with age, intelligence, occupation, and cultural membership. Subsumability by a particular cognitive structure converts potential into actual meaning and differentiates meaningful from rote learning.

The advantages of meaningful learning over rote are well documented (8, 11, 16). A group of 100 words of meaningful learning is not only easier, more economical, and less burdensome than rote learning, but it is also more available in cognitive structure for later use in new learning and problem solving.

In terms of traditional transfer theory, the important variables are those relating to cognitive structure (i. e., the learner's degree of subject-matter knowledge in terms of clarity, stability, generalizability, discriminability) and not solely the degree of similarity between stimuli and responses in two learning tasks. Furthermore, recent prior experience is not regarded as influencing new learning by interacting directly with the stimulus-response components of the new learning task, but only insofar as it modifies important relevant attributes of cognitive structure (2, p. 28).

In effect, then, in meaningful learning transfer theory, only variants of more inclusive "anchored" concepts would tend to have long term retention value. Also, the discriminability of new materials could be enhanced by repetition or by explicitly pointing out similarities and differences between them and their presumed subsumers.

While some researchers (9, 19, noted negative transfer with meaningful materials, Osgood (15) has shown that there is less interference among similar meaningful responses than among unrelated responses in the successive learning of lists of paired associates. A recent experiment by Ausubel *et al.* (5) supported the theoretical view of meaningful retention in a retroactive design. The presentation of a Buddhism passage between the learning of and a test of the retention of a similar previously learned Zen Buddhism passage facilitated rather than inhibited the retention of the Zen Buddhism passage.

Investigations relating to the influence of overlearning related materials on proactive effects have been generally confined to rote learning. Bruce (7) used serial and paired-associate materials and found that increased practice showed an increase in positive transfer. Others have found that under conditions usually associated with negative transfer, increased proactive training minimized and in some cases even reversed the direction of negative transfer (1, 13, 18, 20, 22, 23). Overlearning was effective because it established the

particular relevance of specific elements for specific instances, while simultaneously permitting the positive transfer of general factors. In terms of meaningful verbal learning research, the evidence indicated that the stability of anchoring ideas was positively related to the learning and retention of similar material (3, 4).

Ausubel *et al.* (6) found the proactive effects of learning Buddhism material by Grade 13 students induced neither interference nor facilitation in the meaningful learning and retention of a Zen Buddhism passage. Overlearning of the proactive passage had no significant effects on the meaningful learning and retention of the Zen Buddhism material.

The present study investigated the possibility of positive proactive transfer with use of similar and conflicting verbal materials with eighth grade subjects. Previous research has established that in rote learning theory such similarity would inhibit the learning of new material; nevertheless, in meaningful cognitive theory such similar materials might facilitate new learning by forming useful anchors in the subjects' cognitive structures. Ausubel's model and research design were employed to investigate the possibility of proactive facilitation.

The hypotheses were as follows:

1. Meaningful learning of the proactive passage facilitates, or at least does not inhibit, the learning and retention of the lesson.
2. Facilitation is greater with two readings of the proactive passage than with one. This hypothesis indicates an important basic difference between meaningful learning and rote learning, where literature shows that two readings of an intervening proactive passage would be definitely inhibiting (7).
3. In each instance the effect of the independent variable is significantly greater on immediate retention than on delayed retention.

B. METHOD

1. Learning Materials

The material used to investigate proactive effects consisted of two passages that, on the basis of content analysis, were judged to contain both highly similar and conflicting information. A third completely unrelated passage was presented as control material. All three passages were of appropriate reading level for the average eighth grade student and contained unfamiliar material, as measured by empirical test on a sample of eighth grade students within the same school district.

The lesson, entitled "Glaciers," was adapted from a article in *Scientific American* (10). The article was originally used by Kropp and Stoker (12)

and later by More's (14) study of feedback. The article was concerned with the effect of glaciers on the water economy of the earth. It described present glacial systems and how they have varied throughout history.

The proactive passage was entitled "Icebergs" and was written by the present researcher, with suggestions from a number of science teachers. The article was concerned with icebergs and their origin. It was taken largely from *Ice Age Coming* by Leverett G. Richards (17), a book recommended for eighth grade level students.

A third passage, completely unrelated to the two on glaciers and icebergs, was entitled "Rhodesia" and was written by More (14). All passages were approximately 1300 words in length.

2. *Test of the Effect of the Independent Variable*

The 20 items in the Glaciers test were adapted by More (14) from the items used by Kropp and Stoker (12). According to Kropp and Stoker the reliability of the test, by means of Kuder Richardson #20, for various samples of subjects ranged from .677 to .857.

The learning materials, Icebergs and Glaciers, contained concepts in common as well as concepts in conflict. For example, they both stressed the principle that most of the earth's water is in liquid physical state and is found in the oceans. On the other hand, there were differences deliberately built in by the experimenter: e.g., estimates of total volume of water in glaciers in terms different from those used in describing total dimensions of the largest icebergs.

The investigator and two colleagues selected five questions from the 20 on the test which could be termed "concepts in common," literally present (not simply implied) in both the Glaciers and Icebergs articles. An example is the percentage of land surfaces covered by water. It was assumed that if indeed there were any facilitation in learning the lesson as a result of learning the proactive passage, it would be particularly apparent in these five items.

3. *Procedures*

At the outset of the experiment, subjects were assigned to one of three groups. The sample consisted of 150 eighth grade students drawn randomly from the eighth grade class at a suburban junior high school in Southern California. Subjects were then randomly assigned to the three groups. Because of the nature of the experiment, data were collected only on members of the sample present for all four experimental sessions. The intelligence quotient (*IQ*), used for a covariance control, was obtained from school

records of the California Short-Form Test of Mental Maturity, administered four months prior to the study.

As outlined on Table 1, the Overlearning-Proactive (O-P) group studied the proactive passage (Icebergs) twice, the Proactive (P) group studied the proactive passage once, and the Control (C) group was not exposed to the proactive passage. On Day 1, Group O-P studied the proactive passage, and Groups P and C studied the irrelevant passage. All subjects were told when studying all passages that they were to read at their customary speed, and that they were to be examined on the material at a later time by means of a multiple-choice test. (They were not actually to be tested on any material other than the lesson, but the anticipation of a test on each passage was thought necessary to sustain and equate motivation in all conditions.)

In the second session, two days after the first (i. e., Day 3), Groups O-P and P read the proactive passage, and Group C again read the irrelevant passage.

In the third session, two days after the second (i. e., Day 5), all groups studied the lesson (Glaciers), and all were then tested immediately on that passage.

In the fourth session, seven days after the third (i. e., Day 12), all subjects took the delayed test on retention of the lesson. This test was identical with the immediate test. Then all subjects answered a questionnaire related to the passages read.

In the first, second and fourth experimental sessions, subjects spent the first five minutes of the 40-minute period receiving instructions and the balance of the 35 minutes reading a passage or taking the test. In the third session, which was 80 minutes long, the subjects spent five minutes receiving instructions, 35 minutes reading the lesson, five minutes receiving test instruc-

TABLE 1
ORDER OF LEARNING PASSAGES FOR THE FOUR EXPERIMENTAL SESSIONS
FOR THE THREE GROUPS

Group	Learning sessions			
	I (Day 1)	II (Day 3)	III (Day 5)	IV (Day 12)
O-P	proactive passage	proactive passage	lesson, immediate testing	delayed testing questionnaire
P	irrelevant passage	proactive passage	lesson, immediate testing	delayed testing questionnaire
C	irrelevant passage	irrelevant passage	lesson, immediate testing	delayed testing questionnaire

Note: Group O-P = Overlearning-Proactive; P = Proactive; and C = Control.

tions, and 35 minutes taking the test. No subject was expected to have difficulty in completing any of the tasks within the allotted time.

4. *Analysis of Data*

A comparison of the means on the immediate and delayed tests of the lesson was planned to indicate whether the proactive passage induced either proactive interference or proactive facilitation. Two separate analyses of variance and covariance were performed, both the randomized group design model. The first analysis of variance considered the immediate test as the dependent variable, while the second analysis treated the delayed test as the dependent variable. For the third hypothesis the comparison of individual means would use the Newman-Keuls procedure on the three group mean scores for immediate *versus* their delayed test, if a statistically significant *F* score were found. For the five-question "concepts in common" items, two analyses of variance were planned for the three groups, the first using scores on these questions on the immediate test as the dependent variable, and second using scores on the five questions on the delayed test as the dependent variable. An alpha of .05 was set.

C. RESULTS

By the end of the fourth day of the experiment, complete data were available for 35 subjects in Group O-P, 33 subjects in Group P, and 33 subjects in Group C. By use of random procedure, two of the 35 subjects were dropped from Group O-P to equalize numbers across groups. Raw data on subjects lost from the original sample showed that loss was random with respect to the variables at issue. The degree of similarity in the sample groups was indicated by mean *IQ* of the groups: 102.8 for Group O-P, 97.4 for Group P, and 102.2 for Group C.

The means for Groups O-P, P, and C on the immediate testing, based on the number correct out of 20 possible answers, were 10.76 ($SD = 3.35$), 9.70 ($SD = 3.59$), and 11.30 ($SD = 3.57$), respectively. Means for the test of retention were also based on number correct out of the 20 possible and were 10.30 ($SD = 3.01$), 9.27 ($SD = 3.39$), and 10.91 ($SD = 3.75$) for the three groups.

In accord with the research design, two separate analyses of variance were performed, the first using immediate testing for the three groups as the dependent variable, and then with delayed testing as the dependent variable. Since the *F* scores did not approach the required values needed for rejection of the null hypothesis, the Newman-Keuls procedure for comparison of indi-

TABLE 2
STATISTICAL RESULTS OF ANALYSES OF VARIANCE AND COVARIANCE

Statistical treatment	<i>df</i>	<i>F</i>
Analysis of variance for immediate test as the dependent variable	98	1.809
Analysis of variance for delayed test as the dependent variable	98	1.963
Analysis of covariance for immediate test as the dependent variable	97	.746
Analysis of covariance for delayed test as the dependent variable	97	.889
Analysis of variance for five-item immediate subtest as the dependent variable	98	1.172
Analysis of variance for five-item delayed subtest as the dependent variable	98	.855

vidual means was not required. None of the three null hypotheses was rejected. (See Table 2.)

Because of the substantial correlations between *IQ* and the dependent variable, an analysis of covariance was performed with use of *IQ* as the covariate. The six correlations between immediate and delayed tests and the three groups ranged from .44 to .71. No significant treatment effect was found.

Separate results on five test items that contained definite "concepts in common" from the proactive passage and the lesson were determined on each subject's performance. Means for the three groups on immediate testing were 3.5, 3.2, and 3.6, respectively, while for delayed testing they were 3.5, 3.5, and 3.8. *F* scores on analysis of variance were statistically nonsignificant.

To investigate the subjects' perception of the experiment, especially their view of the relationship between the learning passages, a questionnaire was prepared and presented to all subjects after the retention testing on the last day. Differences in group answers are summarized for each of the eight questions:

1. Nearly all subjects in Groups O-P and P, 25 and 27 subjects respectively, reported that they saw similarities between their proactive passage and the lesson; only 18 subjects in Group C saw similarities between their proactive passage and the lesson.
2. At least 22 subjects in all groups responded that the proactive passage did not make the lesson harder to learn.
3. Twenty-three subjects in Group O-P and 21 in Group P said they noticed facts in their proactive passage that made the lesson easier to learn; only

13 subjects in Group C indicated that learning the irrelevant passage made their lesson easier.

4. In response to the question whether they might have done better if they had been told to watch for similarities and differences in the reading passages, opinion was split within all three groups, with a slight majority of the 99 subjects indicating "Don't Know."

In response to the other questions, more than 90% of the subjects in all groups reported that the vocabulary in the learning passages was appropriate for them and that there was sufficient time allowed for working with the materials.

On the basis of the data from the questionnaire, the largest differences in group answers were in response to questions number 1 and number 3. On the first question, sizable numbers of subjects in both Groups O-P and P recognized similarities between Icebergs and Glaciers; but some subjects in Group C perceived a similarity between Rhodesia and Glaciers. On question 3, Groups P and O-P perceived their proactive passage as facilitating; Group C did not see that relationship in the control material.

D. DISCUSSION

The results of the present study substantiated Ausubel *et al.*'s (6) research. Using the same groupings but with older subjects (grade 13) and different materials, they found the mean for the control group barely higher than for the other two groups. The mean number correct on immediate and delayed tests in this present study was scarcely over half, just as in the Ausubel research. The mean loss in retention between testing sessions in this study was also similar to Ausubel's less than 1.0 point loss for each group.

The failure of this study to show a statistically significant result should not lead to a premature rejection of the theory of meaningful verbal learning. The experimental designs employed heretofore may not yet have possessed the power to reveal the effect, if it exists. If present, it might be too small to override the considerable within group differences. It is possible that a proactive effect did occur in this study but was obscured by other sources of variability, especially previous knowledge and *IQ*. An adequate test of this idea would be a stratified design which would be more sensitive than covariance as used here for controlling confounded variables.

REFERENCES

1. ATWATER, S. K. Proactive inhibition and associative facilitation as affected by degree of prior learning. *J. Exper. Psychol.*, 1953, **46**, 400-404.

2. AUSUBEL, D. P. *The Psychology of Meaningful Verbal Learning*. New York: Grune & Stratton, 1963.
3. AUSUBEL, D. P., & FITZGERALD, D. The role of discriminability in meaningful verbal learning. *J. Educ. Psychol.*, 1961, **52**, 266-274.
4. AUSUBEL, D. P., & YOUSSEF, M. The role of discriminability in meaningful parallel learning. *J. Educ. Psychol.*, 1963, **54**, 331-336.
5. AUSUBEL, D. P., STAGER, M., & GAITE, A. J. H. Retroactive facilitation in meaningful verbal learning. *J. Educ. Psychol.*, 1968, **59**, 250-255.
6. ———. Proactive effects in meaningful verbal learning and retention. *J. Educ. Psychol.*, 1969, **60**, 59-64.
7. BRUCE, R. W. Conditions of transfer of training. *J. Exper. Psychol.*, 1933, **16**, 343-361.
8. COFER, C. N. S. A comparison of logical and verbatim learning of prose passages of different length. *Amer. J. Psychol.*, 1941, **54**, 1-20.
9. ENTWISLE, D. R., & HUGGINS, W. H. Interference in meaningful learning. *J. Educ. Psychol.*, 1964, **55**, 75-78.
10. FIELD, W. O. Glaciers. *Sci. Amer.*, 1955, **193**, 84-92.
11. JONES, M. G., & ENGLISH, H. B. Notional vs. rote memory. *Amer. J. Psychol.*, 1924, **35**, 605-612.
12. KROPP, R. P., & STOKER, H. W. The construction and validation of tests of the cognitive processes as described in the Taxonomy of Educational Objectives. Cooperative Research Project Number 2117, Florida State University, Tallahassee, 1966.
13. MANDLER, G. Transfer of training as a function of degree of response overlearning. *J. Exper. Psychol.*, 1954, **47**, 411-417.
14. MORE, A. J. Delay of feedback and the acquisition and retention of verbal material in the classroom. *J. Educ. Psychol.*, 1969, **60**, 339-342.
15. OSGOOD, C. E. Meaningful similarity and interference in learning. *J. Exper. Psychol.*, 1946, **36**, 277-301.
16. REED, H. B. Meaning as a factor in learning. *J. Educ. Psychol.*, 1938, **29**, 419-430.
17. RICHARDS, L. G. *Ice Age Coming*. New York: Day, 1960.
18. SIIPOLA, E. M., & ISRAEL, H. E. Habit interference as dependent upon stage of training. *Amer. J. Psychol.*, 1933, **43**, 205-207.
19. SUPPES, P., & GINSBERG, R. A. A fundamental property of all-or-none models, binomial distribution of responses prior to conditioning, with application to concept formation in children. *Psychol. Rev.*, 1963, **70**, 139-161.
20. UNDERWOOD, B. J. Proactive inhibition as a function of time and degree of prior learning. *J. Exper. Psychol.*, 1949, **39**, 24-34.
21. ———. Laboratory studies in verbal learning. In E. R. Hilgard, *Theories of Learning and Instruction: The Sixty-Third Yearbook of the National Society for the Study of Education*. Chicago: Univ. Chicago Press, 1964.
22. YARCOZOWER, M. Conditioning test of stimulus predifferentiation. *Amer. J. Psychol.*, 1959, **72**, 572-576.
23. YOUNG, R. K., & UNDERWOOD, B. J. Transfer in verbal materials with dissimilar stimuli and response similarity varied. *J. Exper. Psychol.*, 1954, **47**, 153-159.

School of Education
University of Southern California
Los Angeles, California 90007

RELATIONSHIP OF LIFE STYLE AND INTERPERSONAL NEED ORIENTATION*

University of Missouri-St. Louis and St. Louis College of Pharmacy

NICHOLAS J. DI MARCO AND PHILIP L. KAPNICK

SUMMARY

To assess the r between life style and interpersonal need orientation the Life Style Orientation (LSOQ) and Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B) questionnaires were administered to 538 Ss. The Formalistic and Sociocentric LSOQ dimensions both had significant positive r s with the FIRO-B scales for expressed inclusion, wanted control, and wanted affection; in addition, the Formalistic and Sociocentric dimensions had significant positive r s with wanted inclusion and expressed affection, respectively. The Personalistic dimension had a significant positive r with wanted affection and a significant negative r with wanted control.

A. INTRODUCTION

The Life Style Orientation Questionnaire (LSOQ) was developed to measure one's life style orientation (patterns of needs, values, beliefs, and perspectives) in terms of three dimensions—Formalistic, Sociocentric, and Personalistic (1). These three dimensions are posited to influence behavior to varying degrees. They differ in terms of the locus of control over behavior. The Formalistic dimension reflects the values that one's actions be guided by directives from formal authorities and that control of one's behavior should come from rules, regulations, and procedures. The major values reflected in the Sociocentric dimension are that one should act only after he has reached agreement with others through interpersonal interaction. Mutually derived and accepted group norms should serve as the basis of control of one's behavior. The Personalistic dimension is characterized by values reflecting that one's actions be guided by one's experience and feelings and that control of behavior should come from what one feels is the right thing to do.

Previous studies (2, 4) have examined the relationship between life style and interpersonal need orientation, as measured by the Fundamental Inter-

* Received in the Editorial Office on September 7, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

personal Relations Orientation-Behavior (FIRO-B) and found them to be relatively unrelated. The life style orientation instrument used in these studies incorporated a forced choice format. The LSOQ is a revised version of this instrument, has undergone factor analysis, and utilizes a multiple choice format. In light of the significant change in the life style measure it seems reasonable to re-examine its relationship with interpersonal need orientation.

B. METHOD

Subjects were 538 male first through fifth year pharmacy students representing approximately 98% of the student population at a midwest school of pharmacy. They were administered the LSOQ and FIRO-B (3) during a regular class period.

C. RESULTS

The Pearsonian r s between the Formalistic dimension and FIRO-B scales were .18 with expressed inclusion, .17 with wanted control ($p < .01$), and .09 with wanted inclusion and wanted affection ($p < .05$). The Sociocentric dimension had r s of .23 with expressed inclusion, .21 with wanted control, .17 with expressed affection, and .14 with wanted affection (all $p < .01$). The personalistic dimension had r s of .09 with wanted affection ($p < .05$) and $-.13$ ($p < .01$) with wanted control.

The fundamental need dimensions of inclusion, control, and affection, the expressed and wanted dimension, and the total FIRO-B scores all had positive r s with the Sociocentric ($p < .01$), and with the exception of control and affection ($p < .05$) also with the Formalistic dimension. None of these scores had significant r s with the Personalistic dimension.

D. DISCUSSION

The findings suggest that life style and interpersonal need orientations seem to be slightly related. Specifically, both the Formalistic and Sociocentric life style dimensions appear to be somewhat positively related, while the Personalistic is relatively unrelated to interpersonal need orientation. These findings seem consistent with the descriptions of the life style dimensions. Both the Formalistic and Sociocentric dimensions are characterized by an external locus of control—the organization and group, respectively—thus requiring a fair degree of interaction. The Personalistic dimension, being characterized by an internal locus of control, would be less dependent on others, thus requiring a lesser degree of interaction.

REFERENCES

1. FRIEDLANDER, F. Life style orientation questionnaire. Unpublished mimeograph, Case-Western Reserve University, Cleveland, Ohio, 1971.
2. OLMOSK, K. E. Student life style and reactions to grading. Unpublished Doctoral dissertation, Case-Western Reserve University, Cleveland, Ohio, 1970.
3. SCHUTZ, W. C. The FIRO Scales Manual. Palo Alto, Calif.: Consult. Psychol. Press, 1967.
4. TADDEO, K. J. An ontological study of emerging life styles and marital processes. Unpublished Doctoral dissertation, Case-Western Reserve University, Cleveland, Ohio, 1971.

School of Business Administration
University of Missouri-St. Louis
8001 Natural Bridge Road
St. Louis, Missouri 63121

PERSUASIVE EFFECTS OF EARLY AND LATE MENTION OF CREDIBLE AND NONCREDIBLE SOURCES*¹

Departments of Psychology, University of Maryland and The American University

CHARLES D. WARD AND ELLIOTT MCGINNIES

SUMMARY

A standard persuasive communication was presented to 248 subjects in an attitude-change experiment containing a 2×2 after-only design. The credibility of the communication's source was varied (low *versus* high) along with the sequence in which the credibility information was presented (before the persuasive communication *versus* after). Early mention of the noncredible source was found to inhibit attitude change relative to late mention and to no mention. Neither source, when mentioned late, resulted in attitude change different from the no-mention control. The implications of these results for understanding the effects of source credibility were discussed.

A. PROBLEM

A factor that has been suggested as eliminating the usual influence of a communicator is the presentation of credibility information after the persuasive communication rather than before it. Greenberg and Miller (4) performed two experiments in which a low-credibility communicator was mentioned either before or after a persuasive communication. Prior mention of the negative source resulted in less attitude change than did delayed mention, significantly in one experiment and marginally in the other. This sequence effect was interpreted as being due to a forewarning, implicitly cued by early mention of the noncredible source, that the subsequent information might be unreliable. Heightened vigilance and immunization against later change presumably were the result.

Since no control groups were present in Greenberg and Miller's two ex-

* Received in the Editorial Office on September 10, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research was supported by Contract Nonr 595-21, NR 171-250, with the Office of Naval Research. Part of the data analysis was carried out through the support of the facilities of the Computer Science Center of the University of Maryland, College Park campus. Appreciation is expressed to Duangduen L. Bhanthumnavin for aid throughout the experiment, to Lena A. Nordholm for assistance with the data analysis, and to Lee A. Becker and Judson Mills for helpful comments on earlier drafts of the manuscript.

periments, however, the logical alternative cannot be ruled out that the obtained sequence effect was due to *enhancing* effects of *late* mention. Interestingly, research on cognitive dissonance theory (1, 2) can be interpreted as providing indirect support for this latter notion. Brehm reported that persons who performed a counterattitudinal act and who then were given nonsupportive information for their behavior showed an increase in their liking for the attitude object. This outcome presumably was due to the increase in dissonance produced by the nonsupportive information. A corresponding outcome in the present context, it could be argued, would be shown by a person who changed his attitude toward an initially disliked position and who then was confronted with information nonsupportive of his change (discovery that the source was noncredible). That person might then reduce his sudden increase in dissonance by changing his attitude even further in the same direction.

The results of a study by Husek (6) appear consistent with this reasoning. Husek found more influence for a negative source in a late-mention condition than in an early-mention condition, as would be expected from Greenberg and Miller's results. More provocatively, however, late mention was found to be significantly more effective than the no-mention control, as would be implied by the cognitive dissonance interpretation suggested above. Unfortunately, however, methodological difficulties with respect to procedure and data analysis make Husek's results equivocal (*cf.* 4, p. 128). Unambiguous evidence concerning the effects of early and late mention of noncredible sources therefore is still lacking.

The effects of temporal variations in the mention of a source *high* in credibility were studied by Greenberg and Tannenbaum (5) who were interested in bylines in newspaper and magazine reporting. They found that early mention was most persuasive, followed in descending order by middle mention, no mention, and late mention. Early and middle mention were found to be more effective than late mention, but none of the other comparisons were significant. Mills and Harvey (11) similarly found that their expert source produced more attitude change when mentioned before the persuasive communication than when mentioned afterwards.

The superiority of early mention of a positive source, relative to late mention, presumably is due to the enhancing consequences of early mention (suspension of critical analysis, reduction of counterarguing, etc.). Again, however, the logical alternative can be suggested that the effect may be due, at least in part, to *inhibiting* consequences of *late* mention of the positive source. Mills and Harvey's (11) experiment did not include a no-mention control group, so their results cannot be used for assessing this possibility.

The experiment by Greenberg and Tannenbaum (5) did contain a no-mention control group; their control group was not found to be significantly more persuasive than late mention of the positive source, but the two means were in that direction. Although no theoretical rationale is immediately apparent for this logically possible effect, additional data nevertheless would be of interest.

B. METHOD

The subjects were 248 students (95 males and 153 females) at the University of Maryland, College Park campus. The experiment was carried out by means of a 12-page booklet administered to a lower-level psychology course.

The booklet's first page, which was identical for all conditions, explained the booklet's purpose only as an attempt "to find out how college students react to certain problems of international affairs." The subjects also were told on the first page to go carefully through the booklet without skipping any pages and without looking backward or forward.

The next two sections of the booklet consisted of a four-page persuasive communication and a one-page description of the alleged author (see below). The persuasive communication was entitled, "The Case for Extending International Territorial Boundaries Further Out into the Seas." Most of the arguments were concerned with the (alleged) plight of Gambia, a small country on the northwest coast of Africa, which supposedly was suffering in a number of ways because of the outmoded three-mile limit. The communication advocated an extension to 25 miles for Gambia.

In the High-Credibility condition the author was identified as "Dr. Paul Horst, a West German expert on international law . . . Chairman of the Department of Political Science at the University of Berlin . . . an authority in the field of maritime law . . . Persons who know him well describe Dr. Horst as honest, sincere, and trustworthy." In the Low-Credibility condition the author was identified as "Mr. Paul Horst . . . [a recent graduate of] a liberal arts college in Cologne, where he studied contemporary European literature . . . People who know him well describe him as devious, calculating, and inclined to place personal gain above public welfare."

The description of the author immediately preceded the persuasive communication in the Before sequence; in the After sequence the description immediately followed the persuasive communication. The page containing the description was omitted for the control condition.

Next in the booklet came a page measuring the attitudinal dependent variable. It contained five questions (e. g., "However necessary is it for Gambia

to extend her territorial sea further than three miles?"), each of which was accompanied by a five-point rating scale. The summed scores had a possible range from 5 to 25, with 25 representing maximally favorable attitudes toward extending sea boundaries. The item-total correlations for the composite measure ranged in value from .56 to .73. The remaining pages of the booklet were designed to obtain miscellaneous information about the subject, including reactions to various aspects of the experiment.

Booklets from all conditions were intermixed in random order. They then were distributed and recollected during each discussion session. This procedure allowed all conditions to be represented within each session thus controlling for possible extraneous differences between sessions.

C. RESULTS

1. *Efficacy of Experimental Manipulations*

The last part of the experimental booklet measured the perceived credibility of the source by means of 12 Likert-type items (e. g., "I would consider this author to be an expert on the topic") taken from McCroskey (10). The range of possible scores was from 12 to 60, with a midpoint of 36. A 2×2 analysis of variance, with Credibility and Sequence the independent variables, was performed on the credibility scores, with use of a program by Clyde, Cramer, and Sherin (3). The control group data were included in the analysis. As expected, a large main effect due to Credibility was obtained ($p < .001$; $F = 70.10$, $df = 1/243$). No other effects were significant. The mean credibility ratings were as follows: Credible-Before, 41.16; Noncredible-Before, 33.98; Credible-After, 42.00; Noncredible-After, 35.92; Control, 39.25.

One of the items in the back of the booklet asked the subject to give from memory the location of the author's description relative to the communication. Ninety-seven percent of the subjects made correct responses. The results from this check, along with those from the preceding analysis, indicate that both independent variables were manipulated successfully.

2. *Attitude Measure*

A similar 2×2 analysis of variance was carried out on scores from the attitude measure. The Credibility main effect was significant ($p < .01$; $F = 7.52$, $df = 1/243$), with the Credible source producing more change than the Noncredible. The Sequence main effect also was significant ($p < .05$; $F = 4.40$, $df = 1/243$), with the After condition producing more change than the Before. The Credibility \times Sequence interaction was not significant. The mean attitude scores in the five conditions, with the cell N s indicated in

parentheses, were as follows: Credible-Before, 15.18 (49); Noncredible-Before, 13.39 (52); Credible-After, 15.79 (48); Noncredible-After, 14.86 (50); Control, 16.33 (49).

Individual comparisons were made between the control mean and each of the four experimental means (13, pp. 263-267) in order to determine the direction of influence of each of the four source descriptions. The Noncredible-Before condition was reliably less persuasive than the control condition ($p < .05$). None of the other three means was found to differ from the control. A further analysis was carried out on the means from the four experimental conditions, using the Newman-Keuls procedure modified for unequal N s (9). The analysis indicated that the Noncredible-Before condition was less persuasive than each of the other three conditions ($ps < .05$), while the other three did not differ among themselves. [The present experiment, it may be noted, has been conducted more recently by the present authors in Japan and Sweden (12). The results, although rendered equivocal because of methodological problems, resulted in both cases in a similar tendency for the Noncredible-Before condition to produce the least amount of attitude change.]

D. DISCUSSION

Early mention of the Noncredible source inhibited attitude change. Attitude change was not enhanced (relatively to the control) by late mention of the Noncredible source. The latter outcome differs from Husek's (6) results and thus also contradicts the corresponding interpretation based on cognitive dissonance theory suggested earlier. The inhibiting effect of early mention of a negative source thus may involve an implicit forewarning, perhaps of the unreliability of later information, as suggested by Greenberg and Miller (4). The pattern of means, in fact, is similar to the pattern found by Kiesler and Kiesler (8) for an explicit forewarning of intention to persuade.

The results for the Credible source are less clear, since early mention of that source was not superior to late mention or to no mention. However, the logical possibility that late mention of a credible source inhibits attitude change can be ruled out in the present case, since late mention of the positive source did not lead to significantly less change than produced by the no-mention control. But why was early mention of the Credible source no more effective than late mention?

The answer may be that subjects in both of the Before conditions were distracted from the communication by the prior credibility information, and therefore did not completely learn the communication's contents. Subjects in the two Before conditions thus would have remained relatively unpersuaded

Bureau of Ednl. & Psyl. Research
(S. C. E. R. T.)

Date

by the communication's arguments compared to the nondistracted subjects in the other three conditions. This explanation, which also accounts for the obtained Sequence main effect, cannot be directly tested because the present study did not contain a measure of learning of communication content. Indirect support, however, is available from a study by Kelman and Hovland (7). They found that communication content was remembered less well when the alleged source (who was always mentioned prior to the communication) was positive or negative in credibility than when neutral (i.e., only partially identified). In the former two cases, they suggested, the subjects may have been distracted from the communication by the credibility information because of its relatively great emotional impact. Kelman and Hovland additionally found, consistent with the present results, that their negative source produced less attitude change than the positive and neutral sources, but that the latter two did not differ from each other.

In the case of the present experiment, distraction should not have occurred in the two After conditions or in the control, since in those conditions the credibility information would have come too late or would not have come at all. The earlier conclusion that late mention of the two sources does not produce enhancing or inhibiting effects thus remains unaffected, whether or not distraction did occur in the two early-mention conditions.

The observed inhibition of attitude change because of early mention of a noncredible source may well involve forewarning processes, such as those mentioned by Greenberg and Miller (4). The present results, however, suggest more generally that an additional process—distraction from the communication—may also play an important mediating role.

REFERENCES

1. BREHM, J. W. Increasing cognitive dissonance by a *fait accompli*. *J. Abn. & Soc. Psychol.*, 1959, 58, 379-382.
2. ———. Attitudinal consequences of commitment to unpleasant behavior. *J. Abn. & Soc. Psychol.*, 1960, 60, 379-383.
3. CLYDE, D. J., CRAMER, E. M., & SHERIN, R. J. Multivariate Statistical Programs. Coral Gables, Fla.: Univ. Miami, Biometric Lab., 1966.
4. GREENBERG, B. S., & MILLER, G. R. The effects of low-credible sources on message acceptance. *Speech Monog.*, 1966, 33, 127-136.
5. GREENBERG, B. S., & TANNENBAUM, P. H. The effects of bylines on attitude change. *Journalism Quart.*, 1961, 38, 535-537.
6. HUSEK, T. R. Persuasive impacts of early, late, or no mention of a negative source. *J. Personal. & Soc. Psychol.*, 1965, 2, 125-128.
7. KELMAN, H. C., & HOVLAND, C. I. "Reinstatement" of the communicator in delayed measurement of opinion change. *J. Abn. & Soc. Psychol.*, 1953, 48, 327-335.
8. KIESLER, C. A., & KIESLER, S. B. Role of forewarning in persuasive communications. *J. Abn. & Soc. Psychol.*, 1964, 68, 547-549.

9. KRAMER, C. Y. The extension of multiple range tests to group means with unequal numbers of replications. *Biometrics*, 1956, **12**, 307-310.
10. MCCROSKEY, J. C. Scales for the measurement of ethos. *Speech Monog.*, 1966, **33**, 65-72.
11. MILLS, J., & HARVEY, J. Opinion change as a function of when the information about the communicator is received and whether he is attractive or expert. *J. Personal. & Soc. Psychol.*, 1972, **21**, 52-55.
12. WARD, C. D., & MCGINNIES, E. Persuasive effects of early and late mention of credible and noncredible sources: Three cross-cultural experiments. Technical Report No. 18, Contract Nonr 595-21, NR 171-250, Office of Naval Research, University of Maryland, College Park, December 1970.
13. WINER, B. J. *Statistical Principles in Experimental Design*. New York: McGraw-Hill, 1962.

Department of Psychology

University of Maryland

College Park, Maryland 20742

EMPIRICAL VALIDATION OF ERIKSON'S THEORY OF IDENTITY CRISES IN LATE ADOLESCENCE*¹

Southern Illinois University at Edwardsville

PATRICIA A. STARK² AND ANTHONY J. TRAXLER³

SUMMARY

Ego identity crystallization was studied within the context of Erikson's psychosocial theory of ego identity development. Ego identity and ego diffusion were measured by the Dignan Ego Identity Scale, an instrument based on Erikson's theoretical formulations. It was hypothesized that Ss within the age span of 17 to 20 would report significantly more ego diffusion than their older counterparts ranging in age from 21-24 years, and that females would report significantly less ego diffusion than males within each age group. These hypotheses were tested on 507 midwestern college students in a cross-sectional design which utilized multiple regression analysis. Results supported both hypotheses and indicated that ego identity processes crystallize in late adolescence as postulated by Erikson's psychosocial theory of ego epigenesis. A significant negative correlation between ego identity and anxiety offered additional construct validity for the Dignan Ego Identity Scale.

A. INTRODUCTION

The present study examined the relationship between ego identity, identity diffusion, and anxiety within the framework of Erik Erikson's psychosocial theory of ego epigenesis. Erikson (11, 12, 14) in his eight epigenetic psychosocial stages of development has proposed that the stage of adolescence represents a critical period during which identity processes either crystallize or remain diffused. Although identity has not been clearly defined in Erikson's formulations, he has stressed that it involves the process of testing, selecting, and integrating self-images derived from childhood psychosocial crises in the light of youth's ideological climate. The polar opposite of ego identity,

* Received in the Editorial Office on September 10, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This article is based on the first author's Master's thesis under the direction of the second author.

² Now at St. Louis University, St. Louis, Missouri.

³ Requests for reprints should be sent to the second author at the address shown at the end of this article.

"identity diffusion," refers to the inability of individuals in the late teens and early twenties to establish a vocation or station in life and to commit themselves to an occupational or ideological position.

A number of studies have investigated Erikson's concept of identity crisis. Gruen (15) found that persons with a stable role concept and ego identity rejected false evaluations presented by others unless they were congruent with their own view of their self-concept. Individuals with high ego diffusion, however, were more accepting of others' evaluations even when the evaluations conflicted with their self-image. In a longitudinal study of male college freshmen, Waterman and Waterman (22) assessed changes in ego identity status. They concluded that a positive developmental shift was noted in the area of occupation and suggested that identity characteristics for beginning college students are particularly unstable. Bronson (5) investigated various manifestations of identity diffusion in one of the earliest attempts to establish the construct operationally. He demonstrated the existence of identity diffusion within the period of adolescence and reported that college students who rated low on identity diffusion appeared to be relatively anxiety free. A number of others have shown that increased anxiety is a correlated variable of diffused ego identity (1, 4, 12, 16). Dignan (9) developed the Ego Identity Scale from items adapted from self-report inventories and derived from Erikson's concept of ego identity. The scale is constructed so that lower scores suggest ego identity diffusion and high scores indicate ego identity crystallization. Validity was obtained by correlations of ego identity scores with ratings on five personality dimensions, the Counselor Rating Scale for Identity Traits, the Student Rating Scale, and manifest anxiety scores. Distributions of ego identity scores were basically normal, but the anticipated class differences between female college freshman and sophmores in identity crystallization and the negative relationship between ego identity and manifest anxiety were significant beyond the .01 level (9).

Although the Ego Identity Scale was initially developed and validated with use of female college students only, research on identity development has shown that there are significant differences between males and females on this variable (2, 8, 20). Constantinople (8) found that freshman females scored significantly lower on identity diffusion than did males. Bennett and Cohen (2), in a study of personality patterns, found that, in general, identity in females is better established than in males of similar ages. In a recent study of ego identity development in college students, Stark (20) found that freshman females showed significantly less identity diffusion than their male

counterparts. Numerous other studies have emphasized the importance of sex differences in development (3, 18, 19, 21, 23).

Thus, a review of the literature on ego identity and identity diffusion indicates that the psychosocial crisis on ego identity crystallizes within late adolescence (5, 12) and that diffused ego identity is correlated with anxiety (4, 5, 16). Although Erikson (12) does not specifically mention sex differences in identity formation, previously cited literature and research attest to the importance of sex differences in development. On the basis of the foregoing, it was hypothesized that Ss within the age span of 17 to 20 years would report significantly more ego diffusion within the freshman-sophomore and junior-senior levels than their older counterparts in the age span 21 to 24. Further, it was predicted that females would report significantly less ego diffusion than males within each age group.

B. METHOD

1. Subjects

The Ss were 507 students from middle- and lower-middle-class backgrounds attending an urban midwestern university who volunteered to participate in the study. They ranged in age from 17 to 24 years and included 248 females and 259 males. Of the 507 students, 154 were freshman, 105 sophomores, 141 juniors, and 107 seniors. The two lower and two upper classes were each combined to form two class levels.

2. Instruments

Three test instruments were used: The Dignan Ego Identity Scale, as a measure of ego identity diffusion and crystallization; the Institute for Personality and Ability Testing (IPAT) Anxiety Scale, as a measure of anxiety; and a Self-Report Inventory devised by the authors. The Ego Identity Scale is based on Erikson's description of ego identity and is a paper and pencil test which is easily administered (9). The test, entitled Personal Inventory, consists of 50 items and is available in male or female forms. Each item is given a weight of one, and thus the maximum score possible is 50. As noted previously, the higher the score, the greater the ego identity crystallization. An illustrative item is: "First I try to be like one person I know, then another". Agreement with this statement indicates lack of self-stability and identity diffusion. The IPAT Anxiety Scale is also a paper and pencil test consisting of 40 items designed to measure overt, covert, and total anxiety.

According to Cattell and Scheier (6) the IPAT Anxiety Scale is mainly designed to tap "free-floating manifest anxiety." The Self-Report Inventory consists of 10 questions relating to college academic performance and ego identity crystallization.

3. Procedure

Ss were administered the three instruments by the senior author during the regular class period. In a brief introduction, students were asked to participate in the study and were assured that their answers would be confidential and anonymous. The Ego Identity Scale was given first, and then the IPAT Anxiety Scale and Self-Report Inventory were administered.

C. RESULTS

For purposes of data analysis Ss were divided into two age groups: 17 to 20 years and 21 to 24. Those Ss who did not meet the age criterion were not used in the analysis of data ($N = 60$), since they would be involved in crises focused within developmental stages not related to the present investigation.

1. Test of Hypotheses

Multiple regression analysis was employed to examine the data (17). A full model, containing knowledge of group membership, was established to examine the first major hypothesis developed from Erikson's theoretical position. This algebraic equation was as follows: a_6 (freshmen ages 17-20 group weight) + a_7 (freshmen ages 21-24 group weight) + a_8 (seniors ages 17-20 group weight) + a_9 (seniors ages 21-24 group weight) + a_{10} (group total anxiety scores). It accounted for 20.59 percent of the criterion (ego identity score) variance. The results of the full model may be found in Figure 1. Note that X is constant.

To test the effect of age in relation to ego diffusion, a restricted equation was developed for comparison with the full four-group model. The hypothesis was stated in the null form, as a restriction upon the predictive equation. Age differences were removed via this algebraic restriction: a_6 (freshman ages 17-20 group weight) + a_7 (freshman ages 21-24 group weight) = a_2 (freshman group weight); and a_8 (seniors ages 17-20 group weight) + a_9 (seniors ages 21-24 group weight) = a_3 (seniors group weight). Another way of stating this restriction is to point out that, in fact, we do not have knowledge of age membership within class levels; this restricted model accounted for 18.92 percent of the criterion variance. An F test comparing the squared correlation

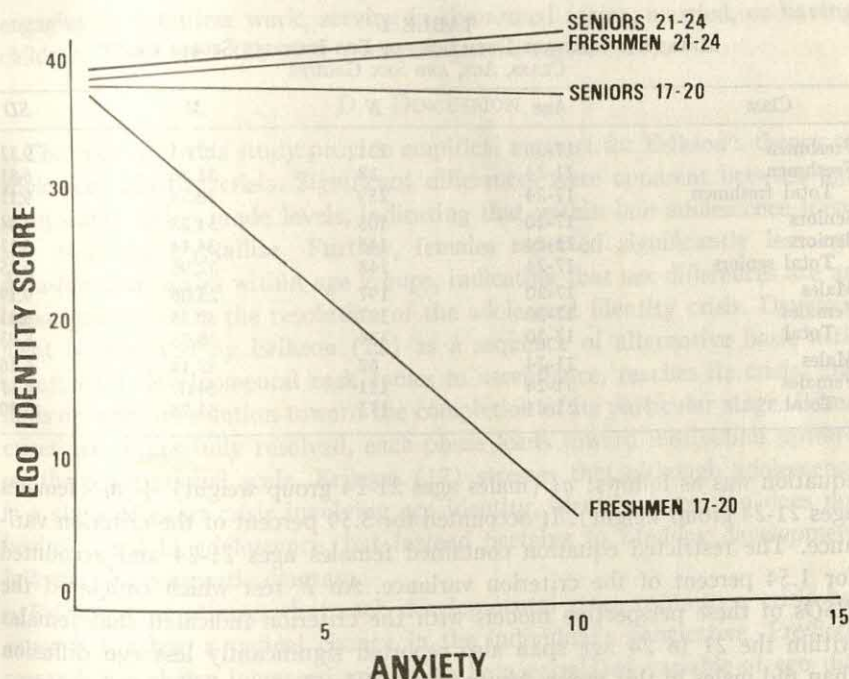


FIGURE 1

DATA PLOTTED FROM THE MULTIPLE REGRESSION MODEL WHICH CONTAINS EGO IDENTITY SCORES, SEPARATE AGE GROUPINGS, AND ANXIETY LEVELS

(*RSQs*) of these two perspective models with the criterion indicated that Ss within the age span of 17 to 20 reported significantly more ego diffusion ($p < .05$) than did Ss from ages 21-24.

A full model containing knowledge of sex differences within the age span of 17 to 20 was established to examine the second hypothesis. This algebraic equation was as follows: a_2 (males ages 17-20 group weight) + a_3 (females ages 17-20 group weight). It accounted for 8.49 percent of the criterion variance. To test the effect of sex differences in relation to ego diffusion, a restricted equation containing females ages 17-20 was developed. It accounted for 1.47 percent of the criterion variance. An *F* test comparing the *RSQs* with the criterion indicated that females within the 17 to 20 age span reported significantly less ego diffusion than did their male counterparts, beyond the .01 level.

To test the second hypothesis further, a full model containing knowledge of sex differences with the 21 to 24 age span was developed. This algebraic

TABLE 1
MEANS AND STANDARD DEVIATIONS OF EGO IDENTITY SCORES FOR
CLASS, AGE, AND SEX GROUPS

Class	Age	N	M	SD
Freshmen	17-20	231	27.35	9.32
Freshmen	21-24	28	31.89	6.81
Total freshmen	17-24	259	28.35	9.17
Seniors	17-20	103	31.28	7.44
Seniors	21-24	145	34.14	6.13
Total seniors	17-24	248	32.96	6.85
Males	17-20	197	28.06	9.19
Females	17-20	137	30.55	8.31
Total	17-20	334	28.95	8.93
Males	21-24	62	32.14	6.16
Females	21-24	111	34.02	6.57
Total	21-24	173	33.78	6.30

equation was as follows: a_4 (males ages 21-24 group weight) + a_5 (females ages 21-24 group weight). It accounted for 5.59 percent of the criterion variance. The restricted equation contained females ages 21-24 and accounted for 1.54 percent of the criterion variance. An F test which compared the $RSQs$ of these perspective models with the criterion indicated that females within the 21 to 24 age span also reported significantly less ego diffusion than did males in this group, beyond the .01 level.

An examination of the means and standard deviations for ego identity scores presented in Table 1 indicates that there is a general trend toward successful resolution of ego diffusion with increasing age for both males and females.

In order to provide additional construct validity for the Ego Identity Scale, a Pearson product-moment correlation coefficient between anxiety and ego diffusion was calculated. The correlation coefficient ($r = -.36$) was significant beyond the .01 level of confidence and corroborates previous research indicating a negative relationship between ego identity and anxiety.

2. Self-Report

Differences in the delayed college entrance group *versus* the immediate group included knowledge and fulfillment of role expectations in conjunction with motivation and goal aspirations, as well as higher overall grade point averages, thus corroborating Centi's (7) findings concerning personality factors in academic achievement (93% of the former group fell within the 4.0 to 4.5 category based on a 5.0 scale). The 35% who entered college after a time interval stated that they had spent this period working for a salary,

engaging in volunteer work, serving in the armed forces, married, or having children. These were the same reasons reported earlier (20).

D. DISCUSSION

The results of this study provide empirical support for Erikson's theory of adolescent identity crisis. Significant differences were apparent between age groups and within grade levels, indicating that within late adolescence identity processes crystallize. Further, females reported significantly less ego diffusion than males within age groups, indicating that sex differences are an important factor in the resolution of the adolescent identity crisis. Development is perceived by Erikson (12) as a sequence of alternative basic attitudes; each developmental task comes to ascendance, reaches its crisis, and finds or seeks its solution toward the completion of its particular stage. When crises are successfully resolved, each phase leads toward motivation upward on the maturational scale. Erikson (12) stresses that although adolescence is a stage of overt crisis involving ego identity, identity formation does not begin or end in adolescence, but instead pertains to life-long development following an epigenetic diagram.

Erikson (14) stresses that each developmental stage contains a crisis because it involves a radical change in the individual's perspective. Previous research has shown increased anxiety to be a correlated variable of ego diffusion (5, 9), and thus the present finding of a significant negative correlation between anxiety and ego identity offers additional construct validity for the Ego Identity Scale.

As Erikson (10) has pointed out, the college atmosphere could be, or is, highly favorable to the stabilization of identity formation. In such an environment the student is presented with a continuous opportunity to examine himself within various spheres of activity without catastrophic failure or premature commitment. In this regard, it is interesting to note that the Self-Report Inventory data indicated that delayed college attendance also facilitated ego identity crystallization. This finding supports Erikson's (11, 13) position that social experiences lessen ego diffusion.

The findings of the present study are noteworthy, since they provide support for both the developmental and social-cultural aspects of Erikson's theory of ego identity development. Thus, chronological age and sex differences are clearly important variables in ego identity crystallization as evidenced in the significant age differences in identity diffusion between 17-20 and 21-24 year age groups, and sex differences within age groups. At the same time, however, environmental factors, such as class standing in college,

would appear to facilitate ego identity crystallization, since college freshmen showed somewhat more identity diffusion than seniors.

In conclusion, there is a definite diminution of ego identity diffusion in late adolescence as the individual crystallizes more clearly his ego identity. Both developmental and environmental factors are involved in this process of ego identity crystallization. Further research is needed to isolate more precisely the crisis fluctuation in this developmental stage.

REFERENCES

1. AUSUBEL, D. P. *Ego Development and the Personality Disorders*. New York: Grune & Stratton, 1952.
2. BENNETT, E. M., & COHEN, L. R. Men and Women: Personality patterns and contrasts. *Genet. Psychol. Monog.*, 1959, **59**, 101-155.
3. BERGER, C. R. Sex differences related to self-esteem factor structure. *J. Consult. & Clin. Psychol.*, 1968, **32**, 442-446.
4. BLOCK, J. Ego identity, role variability and adjustment. *J. Consult. Psychol.*, 1961, **7**, 392-397.
5. BRONSON, G. W. Identity diffusion in late adolescents. *J. Abn. & Soc. Psychol.*, 1959, **59**, 414-417.
6. CATTELL, R. B., & SCHEIER, I. H. The nature of anxiety: A review of thirteen multivariate analyses comprising 814 variables. *Psychol. Rep.*, 1958, **4**, 351-388.
7. CENTI, P. Personality factors related to college success. *J. Educ. Res.*, 1962, **55**, 187-188.
8. CONSTANTINOPLE, A. An Eriksonian measure of personality development in college students. *Devel. Psychol.*, 1969, **1**, 357-372.
9. DIGNAN, M. H., Sr. Ego identity, maternal identification, and adjustment in college women. Unpublished Doctoral dissertation, Fordham University, New York, New York, 1963.
10. ERIKSON, E. H. Growth and crises of the "healthy personality". In C. Kluckhohn, H. A. Murray, & D. M. Scheider (Eds.), *Personality in Nature, Society and Culture* (2nd ed.). New York: Knopf, 1953.
11. ———. Identity and the life cycle. *Psychol. Issues Monog.*, 1959, No. 1.
12. ———. *Childhood and Society*. New York: Norton, 1963.
13. ———. Memorandum on identity and Negro youth. *J. Soc. Issues*, 1964, **20**, 29-42.
14. ———. *Identity: Youth and Crisis*. New York: Norton, 1968.
15. GRUEN, W. Rejection of false information about oneself as an indication of ego identity. *J. Consult.*, 1960, **24**, 231-233.
16. HOWARD, S. M., & KUBIS, J. F. Ego identity and some aspects of personal adjustment. *J. of Psychol.*, 1964, **58**, 459-466.
17. KELLEY, F. J., BEGGS, D. L., & MCNEIL, K. A. *Research Design in the Behavioral Sciences: Multiple Regression Approach*. Carbondale & Edwardsville: Southern Illinois Univ. Press, 1969.
18. NICHOLS, R. C. Personality change and the college. *Amer. Educ. Res. J.*, 1967, **4**, 173-190.
19. POWELL, M. Age and sex differences in certain areas of psychological adjustment. In W. J. Meyer (Ed.), *Readings in the Psychology of Childhood and Adolescence*. Waltham, Mass.: Blaisdell, 1967.
20. STARK, P. A. Diminished ego diffusion as a function of performance on the Dignan

Ego Identity Scale. Unpublished manuscript, Southern Illinois University, Edwardsville, 1971.

21. STEWART, L. H. Change in personality test scores during college. *J. Counsel. Psychol.*, 1964, 11, 211-220.
22. WATERMAN, A. S., & WATERMAN, C. K. A longitudinal study of changes in ego identity status during the freshman year at college. *Devel. Psychol.*, 1971, 5, 167-173.
23. WELLMAN, B. L. Sex differences. In C. Murchison (Ed.), *A Handbook of Child Psychology*. New York: Russell & Russell, 1967.

Psychology Department
Southern Illinois University
Edwardsville, Illinois 62025

ADOLESCENT SELF-ESTEEM, FAMILY COMMUNICATION, AND MARITAL SATISFACTION* ¹

University of Nevada

ROBERTA MATTESON

SUMMARY

One hundred and eleven subjects, 14 and 15 years of age, were administered the Coopersmith Self-Esteem Inventory and two questionnaires, modified from Bienvenu's Adolescent Communication Inventory, eliciting adolescents' perceptions of their communication with both parents. The 10 males and 10 females with the highest self-esteem scores, and the 10 males and 10 females with the lowest scores were identified to form two groups: the High Self-Esteem Group and the Low Self-Esteem Group. Parents of these students completed questionnaires concerning parent-adolescent communication and marital communication and adjustment.

The five hypotheses tested were strongly supported. Adolescents with low self-esteem viewed communication with their parents as less facilitative than did adolescents with high self-esteem. Parents of adolescents with low self-esteem perceived their communication with their spouses as less facilitative, and rated their marriages as less satisfying, than did parents in the High Self-Esteem Group. There was lack of congruence between the perceptions of adolescents with low self-esteem and those of their parents; both mothers and fathers in the Low Self-Esteem Group viewed parent-adolescent communication as more facilitative than did the adolescents themselves.

A. INTRODUCTION

During recent years there has been an increasing awareness of the importance of communication in human relations and growing evidence of communication failures in troubled families and marriages. Ard (1) states that most workers in the social science professions would agree that communication difficulties are basic in many family problems. Nevertheless, most of the

* Received in the Editorial Office on September 19, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This article is based on the author's unpublished Doctoral dissertation, written at the University of Nevada, Reno, May, 1972. The committee chairman was Paul McReynolds.

research in family communication patterns has been concerned with communication processes in families with schizophrenic children (2, 3). Notable exceptions include Navran's (18) correlation study of marital adjustment and husband-wife communication patterns, and Bienvenu's (4, 5) work in developing an Adolescent and a Marital Communication Inventory.

Satir (22, 23) proposes that adolescent disturbances reflect dysfunctional marriages and that there is a relationship between disturbed families, dysfunctional communication, and low self-esteem. Two circular processes appear to be operating in dysfunctional families. First, children learn inadequate communication patterns from their parents which contribute to low self-esteem (22). Such children tend to avoid interpersonal relationships and intimacy; they are generally dependent, submissive, and easily influenced by others and often feel anxious, threatened, and lonely (21). They perceive their parents as being uninterested in them (21, 25). Furthermore, whether or not an observer rates the family communication patterns as functional or dysfunctional is not the determining factor in an individual's reaction to his environment. The individual's attitudes and behavior depend upon his response to *his* perceptions of his family, and researchers must take this factor into account (10, 13, 14, 19, 20).

Several researchers emphasize that it is inappropriate to elicit information about one's perceptions of his family or his parents as a unit; an individual may very well have quite different feelings and attitudes regarding each family member, and an adolescent's perceptions of his interaction with his mother and father should be sampled separately (9, 17, 24). Furthermore, sex is a variable that must be considered influential in determining one's response to others as well as in eliciting responses from others (12).

The second circular process that seems to be operating in disturbed families is the dysfunctional communication pattern between the husband and wife, which is a reflection of, but also contributes to, an unhappy, dissatisfying marriage (22).

B. PROBLEMS

The present study was designed to investigate family communication processes in four areas: first, the relationship between adolescent self-esteem and adolescent-parent communication. If there is a relationship between low self-esteem and dysfunctional communication, one would expect adolescents with low self-esteem to rate their communication with their parents as less satisfactory than would adolescents with high self-esteem.

Second, this study was designed to investigate the relationship between

adolescent-parent communication and husband-wife communication. It seems quite likely that the same inadequate communication associated with adolescent low self-esteem may also be characteristic of marital interactions.

Dysfunctional marital communication may very well reflect and also contribute to an unhappy, dissatisfying marriage. Therefore, this study was designed to investigate a third area, that of the relationship between marital communication and the spouses' happiness and satisfaction with their marriage.

A child's perceptions of his interactions with his parents, upon which he bases much of his behavior and attitudes, may or may not be accurate as far as the parents' actually expressed thoughts and feelings regarding the child are concerned. It was hypothesized for purposes of the present study that adolescents with low self-esteem are much more dissatisfied with the way their parents communicate with them than are adolescents with high self-esteem. A related question concerned the amount of congruence between adolescent perceptions of their communication with each parent and parental perceptions of their communication with the child. It was hypothesized that the evaluations of parent-adolescent communication made by adolescents with low self-esteem and the evaluations of their parents would be incongruent, with the evaluations of adolescents with high self-esteem and those of their parents being congruent.

C. METHODS

1. Subjects

For the purposes of this study, 144 ninth grade high school students were administered questionnaires. Questionnaires of six of the students were incomplete, and 27 students lived with only one parent or with a step-parent; results from these 33 subjects were discarded. The Coopersmith Self-Esteem Inventories of the remaining 111 students were scored and ranked from high to low. Ten boys and 10 girls were selected from the highest end of the self-esteem continuum, and 10 boys and 10 girls from the lowest end. The parents of these 40 students were sent a letter explaining the study and inviting them to participate, followed by a telephone call two days later. Five families did not wish to become involved; these were replaced by students with the next highest or lowest self-esteem scores until the required number of 10 male and 10 female subjects and their parents were assigned to the High Self-Esteem Group, and 10 male and 10 female subjects and their parents were assigned to the Low Self-Esteem Group. The range on the self-esteem scores of the 20

students with low self-esteem was from 54 to 10, while the range of the 20 students with high self-esteem was from 98 to 82.

a. *Age.* Thirteen of the boys and 13 of the girls were 14 years of age, and seven boys and seven girls were 15 years of age. Fathers' ages ranged from 37 to 61, while mothers' ages ranged from 34 to 57, with the number of children per family ranging from two to 10.

b. *Socioeconomic level.* Hollingshead's (11, pp. 36-40) two-factor index, assigning scale values for educational and occupational level, was used to determine socioeconomic level. For identifying placement of specific job titles within the broad occupational categories, Warner's (26, pp. 140-141) revised scale for rating occupations was used.

2. Test Materials

Adolescent subjects completed the 50-item Coopersmith Self-Esteem Inventory, Form A (6), with the eight-item Lie scale items deleted because all subjects—adolescents, as well as those parents who were included in the study—completed the Marlowe-Crowne Social Desirability Scale (8). Students responded to the self-esteem items by putting a checkmark in either the "Like Me" or "Unlike Me" columns. Each answer reflecting high esteem received 2 points, for a total of 100 possible points. The questionnaire has been used with children from nine years of age to the adult level, including college students. Coopersmith has found no significant differences in self-esteem levels between males and females, and points out that the curve is skewed in most samples in the direction of high self-esteem, with means from 70 to 80 and standard deviations of 11 to 13. Scoring instructions (7) list norms for females 9 to 15 as 70.1, for males 9 to 15 as 72.2, and for young adults 16 to 23 as 76.0.

Adolescents also completed a modification of Bienvenu's (4) Adolescent Communication Inventory to elicit adolescent perceptions of how their parents communicate with them. A few of the questions elicit responses in terms of either the mother or father, but for the most part questions are worded in terms of parents as a unit. Therefore, the inventory was modified for use in the present study so that adolescent subjects responded to the same set of questions twice, first in terms of the mother (Mother-Adolescent Communication Inventory), then in terms of the father (Father-Adolescent Communication Inventory). With two duplicate questions from Bienvenu's inventory eliminated, the modified questionnaires each contained 31 questions. Items were answered by checking one of three columns, entitled "Usually," "Sometimes," or "Seldom." Responses indicating facilitative functional com-

munication received 3 points each, with the number of possible points ranging from zero to 93.

In 1967 Bienvenu (4) administered the scale to 376 students, age 13 to 19, in grades 8 to 12. Item analysis revealed that 31 items discriminated between the upper and lower quartiles of favorable and unfavorable responses at the .01 confidence level. The inventory was subsequently administered to 178 students attending school during the regular school term and 97 students attending summer school for makeup work. A *t* test revealed a significant difference at the .05 confidence level between the two groups in parent-adolescent communication. Bienvenu also reported the results of three reliability studies: a split-half corrected Spearman-Brown correlation coefficient of .86 with 75 subjects, a Spearman rho test-retest correlation coefficient of .78 with 84 subjects retested within three weeks, and a Spearman rho of .88 with 63 subjects retested within two weeks.

All parents completed a Fact Sheet which included questions concerning the parents' age, sex, occupation, and years of schooling, and the number and age of children in the family. Each parent also completed the Parent-Adolescent Communication Inventory, which included the same 31 items as both the Mother- and Father-Adolescent Communication Inventories, with the wording changed so that responses were elicited in terms of how the parents perceived themselves communicating with their adolescents.

Mothers and fathers, working individually, also completed Bienvenu's (5) Marital Communication Inventory, which includes 46 questions for a total number of possible points of 138, with higher scores again indicating more facilitative communication. Subjects responded by checking one of four columns entitled "Usually," "Sometimes," "Seldom," or "Never." The number of points assigned to each response varied from zero to 3.

Bienvenu (5) administered the Marital Communication Inventory to 176 married couples. He reported that 40 of the items discriminated between the upper and lower quartiles of favorable and unfavorable responses at the .001 confidence level, and 45 of the items discriminated at the .01 confidence level. The mean score for this group was 105.78, compared to a mean of 105.68 for another sample of 60 subjects. A difference in the expected direction, significant at the .01 level, was found between 23 couples receiving marriage counseling and 23 couples without marital problems, while a split-half Spearman-Brown correlation coefficient of .93 was found in a reliability study with 60 subjects.

In order to assess parents' satisfaction with their marital relationship, each spouse in the present study completed the Marital Adjustment Test devised

by Locke and Wallace (16). This scale contains 15 items selected from previously published marital happiness and adjustment tests because they had the highest discriminatory power in the original studies, were not duplications, and covered what the authors regarded as the important areas of marital adjustment. The range of possible points on the test is from 2 to 158, with higher scores indicating greater adjustment.

Locke and Wallace determined reliability and validity with a sample of 118 husbands and 118 wives, none of whom were married to each other; therefore, the sample represented 236 marriages. A split-half Spearman-Brown correlation coefficient of .90 was found, indicating high reliability. Forty-eight of the subjects were recently divorced, separated, or in marriage counseling; this group received a mean score of 71.7. These subjects were matched with 48 people described as "maritally well-adjusted." This group received a mean score of 135.9. Only 17% of the "maladjusted" group scored 100 or higher on the test, compared to 96% of the well-adjusted group.

All subjects in the present study completed the Marlowe-Crowne Social Desirability Scale (8). The scale contains 33 true-false questions which define behaviors that are culturally sanctioned and approved, but which rarely occur, such as the behavior alluded to in the statement, "I have never intensely disliked anyone." Eighteen of the "True" responses and 15 of the "False" responses are in the culturally sanctioned direction; therefore, the total number of possible points ranges from zero to 33. A low correlation between the Marlowe-Crowne Social Desirability Scale scores and other questionnaire scores can be interpreted as indicating that subjects have not answered the questions in terms of social desirability.

3. Procedures

The Coopersmith Self-Esteem Inventory, the Marlowe-Crowne Social Desirability Scale, and the Mother- and Father-Adolescent Communication Inventories were completed by the 144 ninth grade students during religion classes. Each class period lasted 40 minutes, and this was ample time for all students. Eight different classes, with from 12 to 22 students in each class, participated on three separate days. All questionnaires were administered by the present writer. As described previously, the Self-Esteem Inventories were scored and ranked from high to low. On the basis of these scores, 10 boys and 10 girls and their parents were assigned to the High Self-Esteem Group, and a like number of subjects was assigned to the Low Self-Esteem Group.

All students were told that the purpose of the study was to investigate parent-adolescent communication as well as certain attitudes and feelings

teen-agers may have toward themselves. Communication was defined as verbal as well as nonverbal ways of giving and receiving messages. Students were assured that participation in the study was voluntary, and no one was obligated to turn in the questionnaires after filling them out if he or she did not wish to do so. They were also told that all answers were confidential and that no one but the examiner would see the questionnaires, although some parents would be contacted to invite them to participate in the second phase of the study investigating family communication from the parents' point of view. Students supplied names, addresses, and phone numbers so that parents could be contacted; as soon as the parents' questionnaires were matched up with those of their son or daughter, all identification was removed and subjects were assigned a number.

Fifteen of the couples asked to have the questionnaires mailed to them; the remainder were administered the questionnaires in their homes by the present writer, with the husband and wife working independently. The same explanation and instructions of the study were given as had been given to the adolescents, with the addition that the parents were asked not to discuss the questions until both had finished completing the forms. The time required was generally between 30 and 45 minutes.

D. RESULTS

For adolescents, correlation coefficients between Marlowe-Crowne scores and self-esteem, mother-adolescent communication, and father-adolescent communication were nonsignificant. For mothers and fathers, correlation coefficients between Marlowe-Crowne scores and parent-adolescent communication, marital communication, and marital adjustment were also nonsignificant. Tests of differences between means for the High and Low Self-Esteem Groups were calculated on the following variables: number of children in the family, age of fathers, age of mothers, and socioeconomic level. None of the t ratios were significant.

A split-plot factorial 22.8 analysis of variance design (15, pp. 284-294) was used to analyze the results of the present study. The use of this design allowed for examination of between subject effects on two variables: (a) The A variable (Self-Esteem) at level a_1 , High Self-Esteem, and at level a_2 , Low Self-Esteem. (b) The C variable (Sex) at level c_1 , Males, and at level c_2 , Females.

Within subject effects were analyzed on the B variable, arbitrarily labeled "Inventory Scores" for reference purposes, on scores on the following eight questionnaires: b_1 , Mother-Adolescent Communication Inventory; b_2 , Father-

Adolescent Communication Inventory; b_3 , Parent-Adolescent Communication Inventory, Mother; b_4 , Marital Communication Inventory, Mother; b_5 , Marital Adjustment Test, Mother; b_6 , Parent-Adolescent Communication Inventory, Father; b_7 , Marital Communication Inventory, Father; b_8 , Marital Adjustment Test, Father.

Interaction effects were analyzed at AC (Self-Esteem \times Sex), AB (Self-Esteem \times Inventory Scores), BC (Inventory Scores \times Sex), and ABC (Self-Esteem \times Inventory Scores \times Sex).

Examination of the analysis of variance summary, Table 1, reveals a highly significant difference ($p < .001$) between High and Low Self-Esteem, the A variable ($F = 36.112$). F ratios on variable B, Inventory Scores ($F = 66.007$), and the interaction between Self-Esteem and Inventory Scores, AB ($F = 6.057$), were both highly significant ($p < .001$). The F ratio on the C variable (Sex) was not significant. There were no significant interaction effects between A and C (Self-Esteem and Sex).

TABLE 1
ANALYSIS OF VARIANCE SUMMARY TABLE FOR SPLIT-PLOT FACTORIAL
22.8 STATISTICAL DESIGN

Source	<i>df</i>	<i>MS</i>	<i>F</i>
Between subjects	39		
A (Self-Esteem)	1	60886	36.112*
C (Sex)	1	95	.056
AC	1	931	.552
Subjects within groups	36	1686	
Within subjects	280		
B (Inventory Scores)	7	17483	66.007*
AB	7	1604	6.057*
BC	7	491	1.855
ABC	7	214	.808
B \times Subjects within groups	252	265	
Total	319		

Note: The split-plot factorial 22.8 analysis of variance statistical design used in the present study is presented in Kirk (15, pp. 283-294).

* $p < .001$.

Analysis of the interaction effects of A (Self-Esteem) and B (Inventory Scores) is presented in Table 2. Tests for simple main effects revealed a highly significant difference ($p < .001$) between Self-Esteem and b_1 , Mother-Adolescent Communication ($F = 20.203$), and between Self-Esteem and b_2 , Father-Adolescent Communication ($F = 19.400$). The means of b_1 (78.7) and b_2 (74.9) at a_1 , High Self-Esteem, are higher than the means of b_1 (48.8) and b_2 (45.6) at a_2 , Low Self-Esteem. Therefore, the direction of the significant difference indicates that high self-esteem scores were associated with

high Mother- and Father-Adolescent Communication Inventory scores. The hypothesis that adolescents with low self-esteem would perceive more dysfunction in the way their parents communicated with them than would adolescents with high self-esteem was supported.

In terms of parents' Marital Communication Inventory scores and adolescent self-esteem, the F ratios between Self-Esteem and b_4 , Marital Communication Inventory, Mother ($F = 21.647$), and b_7 , Marital Communication Inventory, Father ($F = 29.532$), were both significant at the $p < .001$ level (see Table 2). The means of b_4 (116.1) and b_7 (119.9) at a_1 , High Self-Esteem, are higher than the means of b_4 (85.1) and b_7 (83.7) at a_2 , Low Self-Esteem. The direction of the significant difference indicates that high adolescent self-esteem scores were associated with high scores on the Marital Communication Inventories for both parents. Therefore, parents of children with low self-esteem did perceive more problems in communicating with each other than did the parents of children with high self-esteem.

A correlation coefficient of .952 ($p < .001$) was obtained when the mothers' Marital Communication Inventory scores were correlated with the mothers' Marital Adjustment Test scores. A correlation coefficient of .953 ($p < .001$) was found when fathers' scores on these two inventories were correlated. The hypothesis that parents who experience marital communications problems rate their marriages as less happy and satisfying than do parents who have few problems communicating with their spouses was thus supported.

The last two hypotheses were stated as follows. Hypothesis 4: There is a significant difference between the Mother- and Father-Adolescent Communication Inventory scores of children with low self-esteem and the scores on the Parent-Adolescent Communication Inventory completed by one or both parents. Hypothesis 5: There is no significant difference between the Mother- and Father-Adolescent Communication Inventory scores of children with high self-esteem and the scores on the Parent-Adolescent Communication Inventory completed by one or both parents.

Examination of Table 2 indicates that interaction effects between B (Inventory Scores) and a_1 , High Self-Esteem ($F = 47.937$), and between B and a_2 , Low Self-Esteem ($F = 24.130$), were both significant. Therefore, Scheffé's S -method test of significant differences between means (15, pp. 268-270) was used to test Hypotheses 4 and 5. The means of b_1 , Mother-Adolescent Communication (78.7), and b_2 , Father-Adolescent Communication (74.9), were compared with the means of b_3 , Parent-Adolescent Communication, Mothers (81.9), and b_6 , Parent-Adolescent Communication, Fathers (74.5), at a_1 , High Self-Esteem. The obtained F (S -method) of .15 was not significant,

TABLE 2
ANALYSIS OF VARIANCE TABLE FOR SIMPLE MAIN EFFECTS INTERACTION
BETWEEN SELF-ESTEEM AND INVENTORY SCORES

Source	<i>df</i>	<i>MS</i>	<i>F</i>
Between subjects			
Between A (Self-Esteem) and b_1 (Mother-Adolescent Communication Inventory)	1	8940	20.203*
Between A (Self-Esteem) and b_2 (Father-Adolescent Communication Inventory)	1	8585	19.400*
Between A (Self-Esteem) and b_3 (Parent-Adolescent Communication Inventory, Mother)	1	922	2.082
Between A (Self-Esteem) and b_4 (Marital Communication Inventory, Mother)	1	9579	21.647*
Between A (Self-Esteem) and b_5 (Marital Adjustment Test, Mother)	1	17598	39.768*
Between A (Self-Esteem) and b_6 (Parent-Adolescent Communication Inventory, Father)	1	469	1.060
Between A (Self-Esteem) and b_7 (Marital Communication Inventory, Father)	1	13068	29.532*
Between A (Self-Esteem) and b_8 (Marital Adjustment Test, Father)	1	12960	29.287*
Within columns	8	443	
Within subjects			
Between B (Inventory Scores) and a_1 (High Self-Esteem)	7	12697	47.937*
Between B (Inventory Scores) and a_2 (Low Self-Esteem)	7	6391	24.130*
AB (Self-Esteem \times Inventory Scores)	7	1604	6.057*
B \times Subjects within groups	252	265	
Total	281		

* $p < .001$.

being smaller than the tabled value for $p < .05$ ($F = 2.79$, $df = 3, 252$). Therefore, Hypothesis 5, postulating congruence on the inventory scores of parents and adolescents in the High Self-Esteem Group, was supported.

The means of b_1 , Mother-Adolescent Communication (48.8), and b_2 , Father-Adolescent Communication (45.6), were compared with the means of b_3 , Parent-Adolescent Communication, Mothers (72.3), and b_6 , Parent-Adolescent Communication, Fathers (67.6), at a_2 , Low Self-Esteem. The obtained F (S -method) of 39.06 was larger than the tabled value of F and significant at the $p < .01$ level of confidence. Therefore, Hypothesis 4, postulating lack of congruence on the inventory scores of adolescents and their parents in the Low Self-Esteem Group, was supported.

E. DISCUSSION

Dysfunctional family communication has been discussed herein in terms of two circular processes. First, the notion of Satir (22, 23) is that children learn inadequate communication patterns from their parents, which contributes to low self-esteem and is associated with submissiveness, loneliness, and anxiety (21). Such feelings alienate one even further, thus reducing opportunities for reality testing and learning more facilitative interpersonal skills. The parents' dysfunctional communication may contribute even more directly to a child's feelings of low self-esteem through devaluing messages or failure to respond positively to a child's need for self-validation. The second circular process which seems to characterize dysfunctional family communication is the tendency for inadequate marital communication to be associated with marital dissatisfaction. The present study was designed to investigate these two processes.

Statistical analysis offered strong support for all five of the hypotheses tested. Adolescents in the Low Self-Esteem Group did indeed perceive communication with both of their parents as more dysfunctional than did adolescents in the High Self-Esteem Group. In view of the highly significant results presented herein, the conclusion seems warranted that the way adolescents perceive their parents communicating with them is strongly associated with adolescent self-esteem.

In regard to the relationship between parent-adolescent communication and marital communication, results showed that parents of children with low self-esteem perceived more problems in communicating with each other than did parents of the children in the High Self-Esteem Group. Furthermore, those parents who experienced marital communication problems rated their marriages as less satisfying than did the parents who experienced more functional communication.

The mean on the Marital Adjustment Test for Locke and Wallace's (16) "maladjusted" subjects was 71.7, while in the present study the mean on this test for parents in the Low Self-Esteem Group was 90.4, indicating much less dissatisfaction with their marriages than was expressed by Locke and Wallace's group. Nevertheless, a highly significant correlation was found in the present study between marital communication and adjustment, offering strong support for the notion that a cyclical relationship between inadequate communication and marital dissatisfaction may be operating in unhappy marriages.

In view of this demonstrated relationship, the association between marital

communication and adolescent self-esteem suggests that dysfunctional communication affects all relationships in the family to some degree. This inference seems valid in view of the fact that subjects were selected on the basis of self-esteem scores only, without any additional evidence of dysfunctional interpersonal behavior, such as psychological testing or identification of emotional disturbances.

Hypothesis 4 proposed a lack of congruence between adolescent and parent perceptions of parent-adolescent communication in the Low Self-Esteem Group, while Hypothesis 5 proposed congruence in the High Self-Esteem Group. Both of these hypotheses were supported. If we may assume that perceptions do have a significant impact on attitudes and behavior, as research evidence strongly indicates, such incongruence could very well be a source of conflict that contributes a great deal to family communication problems and is an important area for future research.

This discussion has tended to focus on the relationship between low self-esteem and dysfunctional family communication. Lest this emphasis obscure the positive findings of the present study, it should be noted that results offered strong support for the notion that high adolescent self-esteem was associated with facilitative parental and marital communication and marital adjustment satisfying to both parents. These findings emphasize the importance of helping people develop interpersonal skills which can be used to encourage positive growth and self-esteem.

REFERENCES

1. ARD, B. N., JR. Communication theory in marriage counseling: A critique. In B. N. Ard, Jr., & C. Ard (Eds.), *Handbook of Marriage Counseling*. Palo Alto, Calif.: Sci. & Behav. Books, 1969.
2. BATESON, G., JACKSON, D., HALEY, J., & WEAKLAND, J. Toward a theory of schizophrenia. *Behav. Sci.*, 1956, 4, 251-264.
3. ———. A note on the double-bind—1962. *Fam. Process*, 1963, 2, 154-161.
4. BIENVENU, M. R., SR. Measurement of parent-adolescent communication. *Fam. Coord.*, 1969, 17, 117-121.
5. ———. Measurement of marital communication. *Fam. Coord.*, 1970, 18, 26-31.
6. COOPERSMITH, S. *The Antecedents of Self-Esteem*. San Francisco: Freeman, 1967.
7. ———. Instructions for scoring and interpreting the Self-Esteem Inventory (SEI). Undated mimeographed paper, Psychology Department, University of California, Davis, California 95616.
8. CROWNE, D., & MARLOWE, D. Scale of social desirability independent of psychopathology. *J. Consult. Psychol.*, 1960, 24, 349-354.
9. ERON, L., BANTA, T., VALDER, L., & LAULICHT, J. Comparison of data obtained from mothers and fathers on child rearing practices and their relation to child aggression. *Child Devel.*, 1961, 32, 457-472.
10. HEILBRUN, A. B., JR. Perception of maternal child rearing attitudes in schizophrenics. *J. Consult. Psychol.*, 1960, 24, 169-173.

11. HOLLINGSHEAD, A. Two-factor index of social position. In W. Boek, E. Lawson, A. Yankauer, & M. Sussman, *Social Class, Maternal Health, and Child Care*. Albany, N. Y.: N.Y.S. Department of Health, undated.
12. HUTCHINSON, J. Family interaction patterns and the emotionally disturbed child. In W. Winter & A. Ferreira (Eds.), *Research in Family Interaction: Readings and Commentary*. Palo Alto, Calif.: Sci. & Behav. Books, 1969.
13. ITKIN, W. Some relationships between intra-family attitudes and pre-parental attitudes toward children. *J. Genet. Psychol.*, 1952, **80**, 221-252.
14. ———. Relationships between attitudes toward parents and parents' attitudes toward children. *J. Genet. Psychol.*, 1955, **86**, 339-352.
15. KIRK, R. E. Experimental Design: Procedures for the Behavioral Sciences. New York: Holt, Rinehart & Winston, 1968.
16. LOCKE, H. J., & WALLACE, K. Short marital-adjustment and prediction tests: Their reliability and validity. *Mar. & Fam. Living*, 1959, **21**, 251-255.
17. NASH, J. The father in contemporary culture and current psychological literature. *Child Devel.*, 1965, **36**, 261-297.
18. NAVRAN, L. Communication and adjustment in marriage. *Fam. Process*, 1967, **6**, 173-184.
19. NOVAK, A., & VAN DER VEEN, F. Family concepts and emotional disturbance in the families of disturbed adolescents with normal siblings. *Fam. Process*, 1969, **8**, 157-171.
20. RABKIN, L. The patient's family: Research methods. *Fam. Process*, 1965, **4**, 105-132.
21. ROSENBERG, M. Society and the Adolescent Self-Image. Princeton, N. J.: Princeton Univ. Press, 1965.
22. SATIR, V. Conjoint Family Therapy. Palo Alto, Calif.: Sci. & Behav. Books, 1967.
23. ———. Peoplemaking. Palo Alto, Calif.: Sci. & Behav. Books, 1972.
24. TASCH, R. J. The role of the father in the family. *J. Exper. Educ.*, 1952, **30**, 319-361.
25. TEC, L. Immunization against drug abuse. *Connecticut Med.*, 1971, **35**, 609-611.
26. WARNER, L., MEEKER, M., & EELLS, K. Social Class in America. New York: Harper & Row, 1960.

University of Nevada
Las Vegas, Nevada 89109

CORRELATIONS AMONG WOMEN'S VIEWS OF CONTRACEPTION, ANXIETY, CREATIVITY, AND EQUALITARIANISM MEASURES*

Livingstone College and Challenge Foundation

JOAN JOESTING AND ROBERT JOESTING

SUMMARY

One hundred thirty-eight female introductory psychology students at a southern state university were given the Taylor Manifest Anxiety Scale, Schaefer's Biographical Inventory Creativity, What Kind of Person Are You, Equalitarianism (Forms A and B), and four scales by the authors: Women's Views of Contraception, Sex-Role Questionnaire, Can Do, and Should Do (the last two deal with women's occupations). Women's Views of Contraception correlated with the five sex-roles scales and the creativity measures. Anxiety was related to Women's Views of Contraception and all sex-role scales except Equalitarianism Form A. The authors speculate that the rapidly changing roles of women tend to increase anxiety.

A. INTRODUCTION

Bruch (2) has suggested that the highly creative woman may risk atypical patterns of living, while Joesting and Joesting (3) found that women's liberation members were significantly more creative than their nonmember peers. The purpose of the present study was to explore women's views in relation to contraception and sex, and to correlate these data with the women's scores on anxiety, creativity, and equalitarianism.

B. METHOD

Ss were 138 females enrolled in an introductory psychology course at a southern state university. The following instruments were administered by the first author: Manifest Anxiety Scale (7); a sex-role questionnaire previously used (4); Equalitarianism, Forms A and B from Tavis (6); Can Do and Should Do which listed occupations selected by the authors, with the Ss checking what women could do and should be able to do in this society;

* Received in the Editorial Office on September 19, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

the Biographical Inventory Creativity (5); What Kind of Person Are You (8); and Women's Views of Contraception, a questionnaire composed by the authors which included such items as "It is harmful for a woman to masturbate." (Ss were instructed to respond either "true" or "false" to this questionnaire, which was scored by a key developed by the authors).

C. RESULTS

Table 1 indicates that all product-moment correlations among Women's Views of Contraception and measures of equalitarianism and creativity are

TABLE 1
CORRELATIONS WITH WOMEN'S VIEWS OF CONTRACEPTION
AND MANIFEST ANXIETY SCALE

Variable	<i>r</i>
<i>Women's Views of Contraception</i>	
Manifest Anxiety Scale	.14*
Sex-Role Questionnaire	.26**
Equalitarianism	
Form A	.27**
Form B	.32**
Can Do	.27**
Should Do	.30**
Biographical Inventory	
Creativity art scale	.27**
Creativity write scale	.24**
What Kind of Person Are You	.15*
<i>Manifest Anxiety Scale</i>	
Sex-Role Questionnaire	.48**
Equalitarianism	
Form A	.10
Form B	.15*
Can Do	.64**
Should Do	.63**

* $p < .05$.

** $p < .01$.

significant at the .01 level, with the exception of the Manifest Anxiety Scale and What Kind of Person Are You. These somewhat low but significant correlations tend to show that the sample of women had atypical or modern views of contraception and sex and, also, had equalitarian views of women's place. According to the results presented in Table 1, women with equalitarian views were significantly more anxious than those with opposing views, which follows Bardwick's (1) view that women's changing values are making women more anxious, especially women who are rejecting the traditional roles of women.

REFERENCES

1. BARDWICK, J. New directions on research on the psychology of women. Paper read at the American Psychological Association, Honolulu, Hawaii, September, 1972.
2. BRUCH, C. B. Sex-role images influencing creative productivity and nonproductivity in women. Paper read at the Southeastern Psychological Association, Atlanta, Georgia, April, 1972.
3. JOESTING, J., & JOESTING, R. A comparison of women's liberation members with their nonmember peers. *Psychol. Rep.*, 1971, **29**, 1291-1294.
4. ———. Attitudes about sex roles, sex, and marital status of anti-war demonstrators. *Psychol. Rep.*, 1972, **31**, 413-414.
5. SCHAEFER, C. E. Manual for the Biographical Inventory Creativity. San Diego, Calif.: Educ. & Indus. Test. Serv., 1970.
6. TAVRIS, C. Woman & man—A *Psychology Today* questionnaire. *Psychol. Today*, 1971, **4** (Feb.), 82-88.
7. TAYLOR, J. A. A personality scale of manifest anxiety. *J. Abn. & Soc. Psychol.*, 1953, **48**, 285-290.
8. TORRANCE, E. P., & KHATENA, J. Technical-Norms Manual for *What Kind of Person Are You*. Athens, Ga.: Univ. Georgia, Georgia Stud. Creative Behav., 1970.

Office of Guidance
Livingstone College
Salisbury, North Carolina 28144

Challenge Foundation
P. O. Box 2094
Chapel Hill, North Carolina 27514

CAREER SALIENCE AS A MODERATOR OF THE RELATIONSHIP BETWEEN SATISFACTION WITH OCCUPATIONAL PREFERENCE AND SATISFACTION WITH LIFE IN GENERAL*

Stevens Institute of Technology

JEFFREY H. GREENHAUS

SUMMARY

It was predicted that the relationship between satisfaction with occupational preference and satisfaction with life in general would be greater for high career salient persons than for low career salient persons. Of three indices of career salience measured, Career Advancement and Planning provided the most support for the hypothesis. It was noted that career salience was a more powerful moderator of the relationship than sex.

A. INTRODUCTION

The relevance of career salience (the perceived importance of work and a career in one's life) to occupational decision making has been the subject of recent research. The data seem to suggest a positive relationship between career salience or commitment and both the congruence between self and occupational concepts (3, 7) and the congruence between chosen and ideal occupations (2).

It is possible that career salience may also moderate the relationship between satisfaction with occupational preference and satisfaction with life in general (LIG). Several studies (4, 5, 6) have reported a positive relationship between job satisfaction and LIG. Brayfield, Wells, and Strats (1), however, found that the correlations between job satisfaction and LIG were higher for males than for females. They speculated that this may be due to a higher level of career orientation or importance among the males.

The purpose of this series of analyses was to test directly the hypothesis that the correlation between the satisfaction with an occupational preference and the satisfaction with LIG would be higher for high career salient persons than for low career salient persons. Also, in line with Greenhaus' (3) finding, three factorially derived dimensions of career salience were used as potential

* Received in the Editorial Office on September 24, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

moderators, instead of one overall index of career salience. Finally, the moderating effects of career salience were tested separately for males and females.

B. METHOD

Subjects were 203 undergraduates at two eastern colleges. The measure of career salience was a 28-item, Likert-format questionnaire. A principal axis analysis and varimax rotation reported by Greenhaus (3) identified three dimensions of career salience: (a) the relative priority of work and a career compared to other sources of life satisfaction; (b) general attitudes toward work; and (c) concern for career advancement and planning. Occupational satisfaction was measured by five items designed to reflect *S*'s satisfaction with the appropriateness of his stated occupational preference. Satisfaction with *LIG* was measured by two five-point items regarding the feelings of satisfaction that *S* had with his total life. All items were presented on the questionnaire in a classroom setting.

C. RESULTS

The correlation between satisfaction with occupational preference and satisfaction with *LIG* was .26 ($p < .05$) for males and .30 ($p < .01$) for females. Table 1 presents the correlations between satisfaction with occupational preference and satisfaction with *LIG* for males and females subgrouped (at the median) on the basis of their career salience factor scores. For the

TABLE 1
CORRELATIONS BETWEEN SATISFACTION WITH OCCUPATIONAL PREFERENCE
AND SATISFACTION WITH LIFE IN GENERAL (*LIG*)
MODERATED BY CAREER SALIENCE

Dimension	Career salience			
	Males		Females	
	Low	High	Low	High
Relative Priority				
<i>r</i>	.132	.394**	.184	.309*
<i>N</i>	46	53	50	54
General Attitudes Toward Work				
<i>r</i>	.222	.298*	.358**	.128
<i>N</i>	49	50	53	51
Career Advancement and Planning				
<i>r</i>	.043	.402**	.165	.530**
<i>N</i>	46	53	53	51

* $p < .05$.

** $p < .01$.

males, all three pairs of correlations were in the predicted direction. Only one difference—for Career Advancement and Planning—approached significance ($Z = 1.83$, $p < .07$). Among the females, Career Advancement and Planning was the only dimension that significantly ($Z = 2.12$, $p < .05$) moderated the relationship between occupational satisfaction and LIG.

D. DISCUSSION

One dimension of career salience—Career Advancement and Planning—stood out as the most effective moderator for both sexes. Perhaps, during the college years, occupational satisfaction heavily reflects the degree to which one feels that he can be successful and competent in his chosen field. If this is the case, it is not surprising that the LIG satisfaction of those who value success and advancement (i. e., Ss high on the third factor) is more highly related to satisfaction with occupational preference than it is for those students who place relatively less importance on these outcomes.

The similarity of the correlations between satisfaction with occupational preference and LIG for males and females may be due to the fact that all Ss were college students. Brayfield, Wells, and Strats, on the other hand, reported that the males in their sample occupied higher job levels than the females. It is likely that Career Advancement and Planning transcends sex as a moderator. That is, the relationship between satisfaction with occupational preference and LIG varies more as a function of Career Advancement and Planning than as a function of sex. Perhaps future research on sex differences in work-related attitudes among employed persons should consider career salience as a variable.

REFERENCES

1. BRAYFIELD, A. H., WELLS, R. V., & STRATS, M. W. Interrelationships among measures of job satisfaction and general satisfaction. *J. Appl. Psychol.*, 1957, **41**, 201-205.
2. GEORGE, P. M. Occupational choices of college students: Centrality of occupation and evaluative-cognitive congruence. Unpublished Doctoral dissertation, University of North Carolina, Chapel Hill, 1965.
3. GREENHAUS, J. H. A factorial investigation of career salience. *J. Voc. Behav.*, 1973, **3**, 95-98.
4. HULIN, C. L. Sources of variation in job and life satisfaction: The role of community and job-related variables. *J. Appl. Psychol.*, 1969, **53**, 279-291.
5. IRIS, B., & BARRETT, G. V. Some relations between job and life satisfaction and job importance. *J. Appl. Psychol.*, 1972, **56**, 301-304.
6. KORNHAUSER, A. W. *Mental Health of the Industrial Worker*. New York: Wiley, 1965.
7. MORRISON, R. L. Self-concept implementation in vocational choices. *J. Counsel. Psychol.*, 1962, **9**, 255-260.

Department of Management Science
Stevens Institute of Technology
Hoboken, New Jersey 07030

EFFECTS OF A COMPETITIVE ENDURANCE TRAINING PROGRAM ON SELF-CONCEPT AND PEER APPROVAL*¹

Departments of Physical Education and Psychology, Brigham Young University

ROBERT W. MCGOWAN, BOYD O. JARMAN, AND DARHL M. PEDERSEN²

SUMMARY

The purpose of this study was to investigate the effects of a cardiovascular fitness program on the self-concept and peer approval of seventh grade boys. Thirty-seven low self-esteem Ss were randomly divided into a control group (participated in no formal physical education activity) and an experimental group (participated in a special running training program).

At the end of an 18 week training program the two groups were significantly different in cardiovascular endurance, indicating the efficacy of the experimental treatment. There was an increase in self-concept from pretest to posttest for the experimental group only. Neither group had a significant change in peer approval.

A. INTRODUCTION

Physical educators tend to promote physical education on the premise that physical fitness leads to the development of the whole person. It is believed that physical conditioning enhances a number of personal variables including the self-concept and the ability to relate to others. Empirical studies have substantiated these beliefs in part. Tillman (7) found that personality changes occurred for males in a training program if they achieved a high degree of physical fitness. In a similar study Reed (5) showed that winning in competitive activities produced a significantly improved self-concept. Stein (6) and Jones (4) both found positive relationships between physical strength and peer approval. Stronger Ss were rated higher in prowess and social popularity, whereas weaker Ss were less popular, experienced feelings of inferiority, and reported difficulty in social relations.

* Received in the Editorial Office on September 24, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This experiment was supported in part by a Faculty Research Fellowship granted to Boyd O. Jarman and Darhl M. Pedersen by Brigham Young University.

² Requests for reprints should be sent to the third author at the address shown at the end of this article.

These studies suggest that by significantly increasing physical fitness through a program of contrived and actual success a person's self-concept and peer relationships should be significantly improved. The purpose of this study was to examine the effects of a success-oriented endurance training program on self-concept and peer approval of seventh grade boys.

B. METHOD

1. Subjects

Ss were 37 male seventh grade students enrolled at Farrer Junior High School in Provo, Utah.

2. Measuring Instruments

a. *Tennessee Self Concept Scale*. The Tennessee Self Concept Scale was developed by Fitts (2) and has a reliability of .92. Ss rated items describing relationships to peers, family, and self as to how descriptive they were of themselves on a five-point scale from strongly agree to strongly disagree.

b. *Cooper's Twelve Minute Run*. This is a measure of cardiovascular fitness which was developed by Cooper (1). The task requires Ss to cover the maximum distance they can by running and walking during a 12 minute time limit. The score is the distance traveled. This score is highly correlated (.90) with the physiological measure of oxygen uptake (VO_2). It is easy to administer and has a high test-retest reliability (.91).

c. *Sociogram*. The Sociogram consisted of a list of all seventh grade males. The Ss indicated their five best friends and circled their own name. It was scored by obtaining the frequency with which each S was selected as a best friend. This was the measure of peer approval utilized in the study.

3. Procedure

During registration in September, 1972, all seventh grade males were given the Tennessee Self Concept test and the Sociogram in that order. Those who scored 47 or below on the Positive Total Score (a general indicator of self-image) of the Tennessee Self Concept Scale and were chosen by three or fewer peers as "best friend" were retained as subjects. During the first two weeks of school all Ss completed Cooper's Twelve Minute Run.

The students who were selected to participate in the experiment were randomly assigned to one of two groups—an experimental group and a control group. The experimental group was an endurance training group. They followed a training schedule similar to a running training program outlined by Gardner and Purdy (3). However, their program was adapted to a three

or four day per week program instead of a seven day per week program. On nonrunning days Ss participated in various competitive activities: viz., floor hockey, basketball, football, and volleyball. Every three to four weeks the experimental group competed against the regular physical education class in a variety of activities including Cooper's Twelve Minute Run.

The endurance training group was positively reinforced for each activity. They were told that they won on each occasion. Sometimes the win was actual, and sometimes it was contrived. For the team sports, players were assigned by the experimenter to the teams in such a way as to assure victory for the experimental group. For Cooper's task, average distances were reported to the Ss in favor of the experimental group whether or not they actually had a better mean distance. They also ran mile and two mile races with experimental and physical education groups mixed. Again the mean time for the experimental group was always reported as superior.

The endurance group was divided into three teams. Average times for the one mile, two miles, one-half mile runs were recorded every third week for each team, as well as for each individual. They ran one mile the first week, two miles the second week, and one-half mile the third week. The winning team was rewarded with sweat suits, golf caps, instructor's praise, and free time during the week. The same rewards were given for outstanding individual efforts. It was arranged so that each team won an equal number of times; i.e., success was administered with a variable ratio of 1/3.

The control group attended regular classes with no participation in physical education classes.

At the end of the 18 week semester the experimental group and the control group were retested on the Sociogram and the Tennessee Self Concept Scale.

4. *Analysis*

The experimental and control groups were compared on each of the three measures by means of a t test to insure equality between the groups on the pretest. A t test for paired data was used to determine whether or not there were significant within-group differences from pretest to posttest over each measure.

C. RESULTS AND DISCUSSION

The t test between groups for the three measures given in the pretest revealed no significant differences, substantiating the randomness of the assignment of Ss to groups. Following the 18 week program the experimental group experienced a positive within-group change in cardiovascular fitness ($t =$

8.71, $p < .005$), indicating the efficacy of the experimental treatment. There was also a significant increase in self-concept ($t = 1.79$, $p < .05$); however, there was no significant difference in peer approval. No significant difference from the pre- to posttesting was found for the control group. This last finding indicates that the scores of the control group Ss on the posttest measures were unaffected by any intervening experiences or by the fact that they had previously taken the measures during the pretest. Thus, it may be concluded that the competitive endurance training program increased self-concept.

REFERENCES

1. COOPER, K. H. *The New Aerobics*. New York: Bantam Books, 1972.
2. FITTS, W. H. *Tennessee Self Concept Scale*. Nashville, Tenn.: Counsel. Recordings & Tests, 1965.
3. GARDNER, J. B., & PURDY, J. G. *Computerized Running Training Programs*. Los Altos, Calif.: Tafnews Press, 1970.
4. JONES, H. E. *Motor Performance and Growth*. Berkeley: Univ. California Press, 1949.
5. REED, D. A. The influence of competitive and non-competitive programs of physical education on body image and self-concept. *Diss. Abst. Internat.*, 1969, **19**, 4312-4313.
6. STEIN, J. U. Physical fitness in relation to IQ, social distance, and physique of intermediate school mentally retarded boys. *Diss. Abst. Internat.*, 1966, **27**, 1253.
7. TILLMAN, K. Relationship between physical fitness and selected personality traits. *Res. Quart.*, 1965, **36**, 485-489.

Department of Psychology
Brigham Young University
1230A SFLC
Provo, Utah 84601

NONVERBAL RIGIDITY AND ITS RELATIONSHIP TO PERFORMANCE ON THREE STANDARD REVERSIBLE FIGURES* ¹

St. Francis College, Southampton College, and Nassau Community College

LOUIS H. PRIMAVERA, WILLIAM E. SIMON, AND SIDNEY H. HOCHMAN

SUMMARY

This study investigated the relationship between nonverbal rigidity, as measured by the Breskin Rigidity Test (BRT), and performance on three standard reversible figures: the Necker Cube, the Rubin Vase, and the Mach Book. No significant relationships between the BRT and frequency of reported reversals for any of the three figures were found. These results were taken to indicate that the BRT does not measure "perceptual rigidity," but may measure what has been called obsessive-compulsive rigidity.

A. INTRODUCTION

Breskin (1) has developed a test of nonverbal rigidity (BRT) which requires a subject to indicate which member in each of 15 pairs of figures he prefers. The test is based on the assumption that "a more rigid person, given the opportunity to express a preference between pairs of figures differing only in 'goodness of fit,' will tend to select the 'better fit' " (p. 1204).

Gorman and Breskin (5) found that nonverbally rigid Ss performed significantly more poorly on various paper-and-pencil measures of creativity and problem solving. Breskin and Gorman (2) found that nonverbally rigid females were more field-dependent on the Embedded Figures Test (7). Breskin, Gorman, and Hochman (3) found that scores on Breskin's test were negatively correlated with the Stroop Color-Word Test (12) and Schaie's Test of Behavioral Rigidity (9). These findings suggest that the BRT measures what might be called "perceptual rigidity": that is, rigidity in performance of perceptually oriented tasks. The purpose of this study was to test this suggestion by determining the relationship between BRT scores and performance on three reversible figures.

* Received in the Editorial Office on September 25, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to thank John Camisa, Kathy Honan, Anthony Pensabene, and Edwin Dombkowski for their assistance in this study.

B. METHOD

Ss were 54 full-time undergraduate students from St. Francis College. There were 38 males and 16 females whose mean age was 20.182 years ($SD = 2.091$).

Three standard reversible figures—the Mach Book (4, p. 124), the Rubin Vase (6, p. 59), and the Necker Cube (8, p. 442)—were used as stimuli for this study. Each figure was drawn in India ink on a 4 inch \times 5 inch white tachistoscope card. The three vertical edges of the Mach Book measured 1 inch, and the four horizontal edges measured $7/16$ inch. The Rubin Vase was $1\ 5/16$ inches in height with the base measuring $7/8$ inch at its widest point and the top measuring $1\ 5/16$ inches at its widest point. The Necker Cube had a side of $7/8$ inch.

Each S was first thoroughly familiarized with the reversible figures by being allowed to examine each of them until he was able to report the usual reversals [see Orbach *et al.* (8) for details]. After each S was well practiced with the figures, he was presented each of them, one at a time, in a Scientific Prototype, Model 900-F, two channel tachistoscope. E instructed S to report each observed reversal. The order of presentation of figures was randomized for each subject, with presentation time held constant at four minutes for each figure. The BRT was administered before the tachistoscope presentation for half of the Ss and subsequent to it for the other of the Ss.

C. RESULTS AND DISCUSSION

The distribution of BRT scores had a mean of 8.481 ($SD = 3.078$). The distribution of frequency of reported reversals had a mean of 46.592 ($SD = 21.632$) for the Necker Cube, 13.796 ($SD = 10.948$) for the Rubin Vase, and 26.648 ($SD = 19.127$) for the Mach Book.

The Pearson product-moment correlations between the BRT scores and frequency of reported reversals for the Necker Cube ($r = -.114$), the Rubin Vase ($r = -.127$), and the Mach Book ($r = -.171$) were all found to be nonsignificant ($p > .05$ in all cases). These results suggest that nonverbal rigidity, as measured by the BRT, is not equivalent to "perceptual rigidity," since it is not able to predict performance on the perceptual task used here. It thus seems that although the BRT involves what appears to be a perceptual task, it is measuring a kind of rigidity that is not purely perceptual in nature. It is possible, as has been proposed by Breskin, Gorman, and Hochman (3), that this rigidity test may measure what has been called obsessive-compulsive rigidity (10). Support for this proposal comes from a

study by Simon, Primavera, Klein, and Cristal (11) who found that non-verbal rigidity was related to psychological need structure as measured by the Edwards Personal Preference Schedule (EPPS). The Breskin test was positively related to the needs for deference, order, abasement, and endurance and negatively related to the needs for autonomy, change, heterosexuality, and aggression. The authors concluded that this pattern of correlation indicates characteristic behavior of many obsessive-compulsive personality types. It is for further research to explore this proposal more fully.

REFERENCES

1. BRESKIN, S. Measurement of rigidity, a non-verbal test. *Percept. & Motor Skills*, 1968, **27**, 1203-1206.
2. BRESKIN, S., & GORMAN, B. On rigidity and field dependence. *Percept. & Motor Skills*, 1969, **29**, 541-542.
3. BRESKIN, S., GORMAN, B., & HOCHMAN, S. Nonverbal rigidity and perserveration. *J. of Psychol.*, 1970, **75**, 239-242.
4. DAY, R. H. Human Perception. New York: Wiley, 1969.
5. GORMAN, B., & BRESKIN, S. Non-verbal rigidity, creativity, and problem-solving. *Percept. & Motor Skills*, 1969, **29**, 715-718.
6. HOCHBERG, J. E. Perception. New Jersey: Prentice-Hall, 1964.
7. JACKSON, D. N. A short form of Witkin's Embedded-Figures Test. *J. Abn. & Soc. Psychol.*, 1956, **53**, 254-255.
8. ORBACH, J., EHRLICH, D. & HEATH, H. A. Reversibility of the Necker Cube: I. An examination of the concept of "satiation of orientation." *Percept. & Motor Skills*, 1963, **17**, 439-458.
9. SCHAIK, K. W. A test of behavioral rigidity. *J. Abn. & Soc. Psychol.*, 1955, **51**, 604-610.
10. SHAPIRO, D. Neurotic Styles. New York: Basic Books, 1965.
11. SIMON, W. E., PRIMAVERA, L. H., KLEIN, B., & CRISTAL, R. M. Personality and non-verbal rigidity: Some preliminary findings. *J. of Psychol.*, 1972, **82**, 127-132.
12. STROOP, J. Studies in interference in serial verbal reactions. *J. Exper. Psychol.*, 1935, **18**, 643-661.

Psychology Department
St. Francis College
180 Remsen Street
Brooklyn, New York 11201

CONSERVATION AND READING ACHIEVEMENT OF SECOND GRADE BILINGUAL AMERICAN INDIAN CHILDREN*

The University of North Dakota

BEVERLY BREKKE AND JOHN D. WILLIAMS

SUMMARY

Bilingual Indian second grade children ($N = 38$) from three New Mexico reservation schools were administered five Piagetian conservation tasks (two conservation of number tasks and three conservation of substance tasks), the Draw-A-Man Test, and the Classroom Reading Inventory. The mean grade placement level was 2.39; 31% of the subjects conserved on all tasks. Correlations were found between three measures of reading level (independent, instructional, and frustration) and success on the conservation tasks. Correlations ranged between .27 and .42. Draw-A-Man Test scores were then partialled out from these correlations; the correlations were essentially unchanged, mainly because of a low correlation of the Draw-A-Man Test with the scores on the Classroom Reading Inventory.

A. INTRODUCTION

Piaget's studies have identified the characteristic thinking processes that comprise the stages of cognitive development. A child's acquisition of conservation of number and substance marks the entrance to the concrete operations stage from 7-11 years of age, and signifies the child's ability to construct an internal system of logic to compensate for perceptual changes in the environment. There has been little research beyond the studies of Almy and Elkind to relate Piaget's findings on the development of cognitive abilities during these stages to the abilities involved in learning to read.

The cross-sectional study of Almy *et al.* (2) dealt with conservation of number and continuous quantity among kindergarten, first grade, and second grade children in two schools from middle-class and lower-class neighborhoods. The results showed that 48 percent of the children in second grade in the middle-class school conserved on all tasks. The mean grade placement reading level for these children was 3.73 according to scores on 1st

* Received in the Editorial Office on September 28, 1973, and published in *The Journal of Psychology*, 1974, **86**, 65-69. Copyright by The Journal Press.

York Test of Growth in Reading. In contrast, only 23 percent of the second grade children in the lower-class school were able to conserve, and the mean grade placement reading level there was found to be 2.49. The sequential development of conservation in the lower-class children was similar to that of the children in the middle-class school, but the pace was slower. The findings of the longitudinal part of the same study revealed a moderately high correlation between conservation and reading achievement.

Other research efforts have considered the relationship of Piaget's stages to reading instruction. Raven and Salzer (7) have pointed out that reversibility and decentration have substantial importance for beginning reading. Almy (1) has indicated that the child's understanding of reciprocal relationships achieved in reversibility during the concrete operational stage may be related to his stability of perception. This is necessary for visual discrimination as well as directionality in beginning reading instruction. In another study, Elkind *et al.* (3) found a correlation between reading achievement and recognition of modified words in scrambled or rotated form. Decentration is involved in the recognition of words in these modified forms. Decentration develops with conservation during the concrete operational stage.

Another aspect of the present study concerns the relationship between bilingualism and reading. Macnamara's (5) examination of 75 studies found that bilinguals have less understanding of oral-aural command of English than monolinguals. In regard to reading, O'Brien (6) has drawn implications of such research for the bilingual child as the problem of presenting letters, the symbols of sound, before he can perceive the sounds auditorily. This may result in confusion or failure in learning to read.

The purpose of the present study was to determine what relationships exist between conservation and the progress in beginning reading of bilingual Indian children. It raises the question as to the extent that conservation may be utilized as a predictor of readiness for beginning reading instruction. Can the stage of cognitive development help to explain the Indian child's failure or success in learning to read?

B. METHOD

1. Subjects

The subjects in the present study were 38 (17 females and 21 males) Indian children from a New Mexico reservation; their first language was Zuni, and their second was English. All of the children were randomly selected from nine second grade classrooms in three reservation schools. The subjects ranged from 6 years 5 months to 9 years 4 months in chronological age,

from 78-118 in standard scores for the Draw-A-Man Test, and from below preprimer to sixth grade instructional reading levels.

2. Procedure

Conservation of number and substance tasks were individually administered to each child. The procedures were organized into five tasks to assess the child's acquisition of conservation as follows:

Task I. Conservation of Inequality of Number with 17 pieces of bubble gum and 19 pieces of candy: A starting position of inequality was established by the child. Next, a transformation was made by pushing the sets of candy and gum into two separate bunches. Then the child was asked, "Are there more pieces of candy, more pieces of gum, or the same number of pieces of candy and gum?"

Task II. Conservation of Equality of Number with 18 pieces of bubble gum and 18 pieces of candy: After the child made a one to one correspondence of equality, a transformation was performed by pushing the pieces of bubble gum close together and stretching the pieces of candy out in lines. The child was questioned, "Are there more pieces of candy, more pieces of gum, or the same number of pieces of candy and gum?"

Task III. Conservation of Equality of Substance with two equal-sized clay balls: The child established that the two balls of clay were the same size. Then he transformed one ball into a hot dog shape and was asked, "Which has more, or do both have the same amount?"

Task IV. Conservation of Inequality of Substance with two unequal-sized balls: After the child determined that one ball had more, the smaller ball was transformed into a pancake shape by the child. Then he was questioned, "Which has more, or do both have the same amount?"

Task V. Conservation of Equality of Substance with two equal-sized balls: The child identified the balls as being the same size. Then he transformed one ball into little pieces. He was asked, "Which has more, or do both have the same amount?"

The child was queried, "How do you know?" after each transformation answer. The resulting justification clarified the response as either conserving or nonconserving.

For each task a conservation response was scored 1, and the total possible conservation score for each child was 5. Nonconservation responses were scored zero. A child who succeeded on all five conservation tasks was defined as a conservor. A child who responded inconsistently and did not acquire conservation was considered to be a nonconservor.

Intelligence was assessed by the Goodenough Draw-A-Man Test (4), since it is said to provide a nonverbal measure for the bilingual child. The instructional reading level was determined by an individually administered diagnostic reading test, the Classroom Reading Inventory (8).

C. RESULTS

The mean chronological age was 8 years 2 months; the mean grade placement reading level was 2.39. Further, 12 (31%) of the children were conservers. Aside from being somewhat older, the Indian children appear to be similar on these variables to Almy's group of lower-class children.

Table 1 contains the correlations and partial correlations of conservation with the three measures of reading level. The correlations of the Draw-A-Man Test with the three measures of reading level are also included. The correlations of the measures of conservation with the reading levels are phi coefficients.

TABLE 1

CORRELATIONS AND PARTIAL CORRELATIONS FOR CONSERVATION, THE DRAW-A-MAN TEST, AND READING LEVEL AMONG INDIAN RESERVATION CHILDREN ($N = 38$)

Variables	Independent	Reading level	
		Instructional	Frustration
Conservation of number	.57	.35*	.35*
Conservation of substance	.35*	.38*	.38*
Conservation of both number and substance	.40*	.42**	.42**
Draw-A-Man	.01	.07	.07
Conservation of number (Draw-A-Man partialled out)	.29	.36*	.36*
Conservation of substance (Draw-A-Man partialled out)	.36*	.37*	.37*
Conservation of both number and substance (Draw-A-Man partialled out)	.41*	.42**	.42**

* Significant at the .05 level.

** Significant at the .01 level.

It can be seen in Table 1 that the measures of conservation are significantly related to the three measures of reading level. The relationships remain significant and almost unchanged when the Draw-A-Man Test is partialled out. The low correlations of the Draw-A-Man Test with the reading levels are extremely low and call into question the usefulness of the Draw-A-Man Test with a culturally different group. The Draw-A-Man Test did show some correlation with the conservation tasks, however.

D. DISCUSSION

In an overall sense, the Indian children appear to be similar to Almy's previously described lower socioeconomic children. Since the living conditions for these Indian children could best be described as lower socioeconomic, this result is not surprising.

The correlations found between the measures of conservation and the three measures of reading level ranged between .27 and .42. When the scores from the Draw-A-Man Test were partialled out, these correlations remained almost unchanged. This result was in no small measure due to the surprising lack of correlation of the Draw-A-Man scores with the three measures of reading level. On the other hand, scores from the Draw-A-Man Test did correlate fairly well with the measures of conservation. On the one hand, this might be due to the similarity of the conservation tasks and the process involved in the Draw-A-Man Test; that is, both activities tend to be performance activities. On the other hand, the conservation tasks *did* correlate with the reading levels, and the Draw-A-Man Test did not. One of the most common uses of intelligence testing is in predicting academic performance; here, the present test (Draw-A-Man) did not show any degree of correlation with reading level. In light of the suggested usage of the Draw-A-Man Test as a useful measure of intelligence for the bilingual child, the usefulness of the test must be questioned, at least in regard to its usage with the Indian reservation child.

REFERENCES

1. ALMY, M. Young children's thinking and the teaching of reading. In W. Cutts (Ed), *Teaching Young Children To Read*. Proceedings of a conference, November 14-16, 1962. Publication No. 19, U.S. Department of Health, Education, and Welfare, Office of Education, Washington, D. C. 1964. Pp. 97-102.
2. ALMY, M., CHITTENDEN, E., & MILLER, P. *Young Children's Thinking*. New York: Teach. Coll. Press, 1966.
3. ELKIND, D., HORN, J., & SCHNEIDER, G. Modified word recognition, reading achievement, and perceptual decentration. *J. Genet. Psychol.*, 1965, **107**, 235-251.
4. HARRIS, D. B. *Children's Drawings as Measures of Intellectual Maturity*. New York: Harcourt, Brace & World, 1963.
5. MACNAMARA, J. *Bilingualism and Primary Education*. Edinburgh: Univ. Press, 1966.
6. O'BRIEN, C. *Teaching the Language-Different Child To Read*. Columbus, Ohio: Merrill, 1973.
7. RAVEN, R., & SALZER, R. Piaget and reading instruction. *Reading Teach.*, 1971, **24**, 630-639.
8. SILVAROLI, N. J. *Classroom Reading Inventory*. Dubuque, Iowa: Brown, 1972.

Center for Teaching and Learning
The University of North Dakota
Grand Forks, North Dakota 58201

PARENTAL EXPECTATIONS OF PSYCHOTHERAPY*

University of Oklahoma Health Sciences Center

STEVEN L. WEISS AND ERIC L. DLUGOKINSKI

SUMMARY

This study was undertaken to investigate the interrelationships among social class, demographic variables, duration of therapy, and parent's expectations of psychotherapy. Parents were asked to respond to a questionnaire regarding a therapist's anticipated behavior with their child. Results indicated that while demographic variables were not related to length of stay in treatment, social class variables were. Although none of the attitudes was associated with the duration of treatment, the evidence suggests that parents expect different behaviors in accordance with (a) their own social position and (b) the age, sex, and race of their child. Finally, an attempt was made to integrate the host of factors that interact to shape the process and outcome of psychotherapy.

A. INTRODUCTION

Hollingshead and Redlich (3) have reported that upper socioeconomic class individuals who seek psychiatric treatment are more apt to receive intensive outpatient psychotherapy, while those in the lower social classes more typically receive short-term therapy, drugs, or custodially oriented hospitalization. Moreover, Myers *et al.* (6) and Petroni (8) found that socioeconomic status varies inversely with the length of hospitalization, further illustrating the differential standards in mental health care.

Even with economic factors reduced (as in a public clinic whose stated policy is to accept treatment cases from all social strata), Schaffer and Myers (11) established that the undertaking of intensive outpatient psychotherapy was far more frequent if the prospective patient was a member of an upper social class. Moreover, the treatment was more likely to be administered by an experienced staff member, the higher the social class.

A number of investigators (5, 10) have independently ascertained a similar relationship in both inpatient and outpatient settings. Discriminatory

* Received in the Editorial Office on September 28, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

treatment of lower social classes on the part of public and private agencies alike has been described by Imber, Nash and Stone (4) as the central factor that inhibits their utilization of services. Thus far, however, little research has been carried out to determine how the patients' expectations of therapeutic encounters vary as a function of social class and related variables.

Weinstein (12) has emphasized that helping professionals can deal more effectively with the patient's psychotherapy if they delve more deeply into his system of beliefs, attitudes, and expectations of treatment. In this connection, Gochman (2) has stated that the expectancy of treatment benefits is directly related to the intention to seek out mental health services. Overall and Aronson (7) have suggested that whether or not a patient of lower social-economic status (SES) returns for subsequent treatment after an initial interview is closely related to the fulfillment of his expectations during that session. They found that the lower class patient expects the therapist to be active and medically oriented and is disappointed when treatment does not conform to these expectations. However, they did not consider how expectations operate across all social class levels, nor did they relate whether parents hold similar expectations when their children are involved in treatment.

The current investigation considers the interrelationships of several variables that potentially influence the initiation, process, and termination of treatment. To extend the work of Overall and Aronson, the authors examine the degree and direction of association among demographic variables (sex, age, race); socioeconomic variables (occupation, education, and index of social position); parental expectations (active, medical, supportive, passive, psychiatric); and duration of treatment (number of sessions seen).

B. METHOD

1. *Subjects and Setting*

Subjects were 100 parents whose children were referred for treatment at an outpatient child psychiatry clinic administered by the Division of Child Psychiatry at a large southwestern medical center. Children who were previously in treatment, obviously psychotic, or in need of primary medical attention were not employed in the study.

The clinic itself is situated two miles from the medical center campus in a modern two-story building which serves a dual function as a training agency for psychiatric residents and psychology interns and a community based child psychiatry facility. The staff includes four psychiatrists, two psychologists, two social workers, and two educational specialists. In addi-

tion, four psychiatric residents, two psychology interns, and two six-week medical students on rotation comprise the complement of trainees. Fees are arranged on a sliding scale based on ability to pay.

With use of Hollingshead and Redlich's two-factor formula (3), education, occupation, and index of social position (ISP) ratings were computed for each subject.

Therapists were psychiatric residents, staff child psychiatrists, clinical child psychologists, and social workers, ranging in age from 28 to 55 and in experience from two to 29 years.

2. The Questionnaire

In order to make the scale suitable for the purposes of the investigation Overall and Aronson's 35-statement questionnaire was administered, together with the standard application form, to parents whose children had been referred for treatment. Parents were instructed to complete the questionnaire regarding a therapist's anticipated behavior with their child. These measures were obtained prior to an intake interview or to the assignment of a therapist. Following the format used by Overall and Aronson, statements were divided into categories devised to tap five aspects of the therapist's behavior. These are listed below.

a. *Active.* The therapist actively instructs or directs the patient: e. g., Do you think the doctor will give your child definite rules to follow?

b. *Medical.* Focus on the organic or physical problems of the patient: e. g., Do you think the doctor will be interested in your child's digestion?

c. *Supportive.* Focus on the avoidance of charged material in order to comfort the patient: e. g., Do you think the doctor will want your child to look at the bright side of things?

d. *Passive.* The patient is given the burden or responsibility for the session: e. g., Do you think the doctor will want your child to do most of the talking?

e. *Psychiatric.* Focus on emotional material: e. g., Do you think the doctor will be interested in hearing about your child's personal problems?

Supplementary information was gathered from the application form regarding the sex, age, and race of the indexed patient, as well as the total number of sessions the patient was seen.

C. RESULTS

1. Variables—Sex, Age, and Race

Of the 100 children referred for therapy during a 12-month period, 60% were males and 85% of the children were white. The largest single subgroup

TABLE 1
INTERCORRELATIONS OF DEMOGRAPHIC, DURATIONAL, ATTITUDINAL, AND SOCIAL VARIABLES

Variables	Demographic			Social class		ISP	Durational		Attitudinal			Psy- chi- atric
	Sex	Race	Age	Educa- tion	Occu- pation		No. of ses- sions	Active	Med- ical	Sup- por- tive	Pas- sive	
Demographic												
Sex	—											
Race	— .00	—										
Age	— .103	.008	—									
Social class												
Education	.203	.339**	— .178	—								
Occupation	.239*	.250*	— .182	.797**	—							
ISP ^a	.234	.292**	— .186	.896**	.981**	—						
Durational												
No. of sessions	.141	.113	.060	.195*	.182	.204*	—					
Attitudinal												
Active	— .012	— .293**	.347**	— .434**	— .358**	— .395**	.083	—				
Medical	.138	— .124	.076	— .123	— .081	— .096	.076	.301	—			
Supportive	— .197*	— .196*	.266**	— .438**	— .308**	— .403**	.041	.520**	.161	—		
Passive	— .005	— .033	.314**	— .090	— .030	— .058	.020	.112	.166	— .008	—	
Psychiatric	.112	— .102	.104	— .134	— .026	— .060	— .104	.049	.180	.227*	.145	—

^a ISP = index of social position.

* $p < .05$.

** $p < .01$.

TABLE 2
MEANS FOR ALL GROUPS ON ALL VARIABLES

Variables	All N = 100	White males N = 51	Black males N = 9	White females N = 34	Groups Black females N = 6	All whites N = 85	All blacks N = 15	All males N = 60	All females N = 40
Demographic									
Age ^a	2.87	2.78	2.88	3.03	2.83	2.94	2.86	2.80	3.00
Social class									
Education	19.37	17.08	24.38	20.15	26.67	18.28	25.40	18.30	21.10
Occupation	40.29	35.12	48.38	43.64	52.50	38.40	50.00	37.30	45.10
ISP ^b	59.53	52.14	72.75	63.48	79.10	56.30	72.70	55.80	65.80
Durational									
No. of sessions ^c	2.89	3.10	2.78	2.73	1.75	2.96	2.35	3.05	2.75
Attitudinal									
Active	4.12	3.84	5.56	3.91	5.50	3.87	5.54	4.13	4.20
Medical	6.83	6.98	7.78	6.29	7.17	6.71	7.47	6.58	7.11
Supportive	2.06	1.68	2.78	2.35	2.50	1.94	2.62	18.7	2.38
Passive	3.47	3.47	3.44	3.44	3.67	3.46	3.54	3.47	3.41
Psychiatric	8.80	8.82	9.00	8.71	8.83	8.77	8.93	8.85	8.73

^a Age was coded as follows: Age range 0-4 was assigned a coded score of 1; 5-8 = 2; 9-12 = 3; 13-16 = 4; 16+ = 5.

^b ISP = index of social position.

^c Number of sessions was coded as follows: 1 session was assigned a coded score of 1; 2-3 = 2; 4-6 = 3; 7-9 = 4; 10+ sessions = 5.

referred for treatment was white males, accounting for 51% of the sample. The age range of the children referred for treatment varied from ages three through 16 with a median referral age of 12. Tables 1 and 2 present the intercorrelations among the variables and the group means, respectively.

The data in Table 1 and Table 2 indicate a tendency for whites and males to stay longer in therapy, but neither of these was significant ($p > .05$). As a general finding, sex, race, and age were not significantly related to the number of sessions in treatment.

2. *Socioeconomic Variables—Education, Occupation, and Index of Social Position*

As expected, there is a high positive intercorrelation among the socioeconomic variables. The data indicate that parents with more extensive educational backgrounds who referred a child for therapy were also more likely to have a higher occupational level and higher class status (i. e., ISP). The higher the social class, the more likely that the child referred would be male and white. Moreover, educational status and ISP were both positively associated with length of stay in therapy ($p < .05$). Similarly, parents with higher status occupations were more likely to refer white, male, and younger children for therapy.

Table 1 also indicates that as social status increased so did the tendency that the child would be seen for a greater number of sessions. Parents with higher social positions tended to refer males, whites, and young children for treatment.

3. *Parental Expectations of Therapy*

The five attitudes toward therapy (active, medical, supportive, passive, psychiatric) were analyzed as they related to one another, to demographic variables, to socioeconomic variables, and to number of sessions in therapy. There is a generally positive intercorrelation among the attitudes (see Table 1). For example, parental expectation of active behavior in therapy is positively associated with medical and supportive behaviors from the therapist ($p < .01$). In addition, there is a positive correlation between psychiatric and supportive attitudes ($p < .05$).

Demographically, the results indicate that (a) parents referring girls for therapy expected more supportive behavior from the therapist than parents referring boys ($p < .05$), (b) parents referring black children for therapy expected more active ($p < .01$) and supportive behavior ($p < .05$), and (c) parents referring older children for therapy expected more active, sup-

portive, and passive behavior on the the part of the therapist ($p < .01$, for all three conditions).

The apparent contradictions in these associations will be discussed in a later section with particular reference to the meaning and interdependence of attitudes within the scale.

Each of the three socioeconomic variables shows a similar relationship to expectation of behavior in therapy. As education, occupation, and social status diminished, there was an increasing expectation of more supportive and active behaviors in the therapeutic process. By contrast, parents with higher education, occupation, and social status expected less supportive and active behaviors on the part of the therapist ($p < .01$, for all three types of parents).

Interestingly enough, none of the five attitudes was related to length of stay in therapy. Even in separate analyses of each subgroup (whites, blacks, males, and females) the attitudes still did not show significant relationships to length of stay in therapy.

D. DISCUSSION

The results of this study will be discussed with respect to three interrelated dimensions of the therapeutic environment: namely, (a) identification of patient population (demographic and socioeconomic), (b) expectations of anticipated therapeutic behavior, and (c) duration of treatment.

It was noted that the higher the social class of the parent (in terms of education and occupation), the less likely that the child referred for treatment would be female. Several alternative explanations might account for such a difference. It is conceivable, for example, that upper class parents are either more concerned about the welfare of their male children or more aware of their difficulties. However, the findings of Davis (1) and Pope (9) that upper class parents view male aggressive behavior as both less tolerable and more maladaptive than their lower class counterparts seem to account most adequately for the higher proportion of male referrals from upper socioeconomic levels.

The results support the contention that parents who hail from the lower social classes expect the character of their child's psychotherapy to be both more active and supportive ($p < .01$, for both attitudes) than parents from the upper socioeconomic grouping. The literature confirms these findings for the active orientation. The lower class patient expects tangible and active behavior on the part of his therapist. Analysis of the second factor, supportive behavior, is less clear-cut. Overall and Aronson's operational

definition of supportive behavior as "the avoidance of charged material" (7, 79) constitutes only one acceptable definition of the term. It can be argued with some justification that support from the therapist may involve a diametrically opposed conception of behavior: namely, focusing on the charged material while supporting the patient's attempts to resolve the underlying conflict. Whether or not a lower class patient would expect a supportive orientation from the therapist in these terms is a moot question, at least in terms of the objectives of this investigation. It does, however, illustrate the danger in accepting labels at face value without delving more deeply into their denotive and connotative features.

Furthermore, the tendency of parents to expect a supportive attitude from the therapist when the indexed patient was female might be related to the societal prohibitions involved in "mollycoddling" the male child. Conceivably, the stigma of viewing the boy as a "sissy" is potent enough to prevent the expectation of "supportive" therapeutic behaviors.

Analysis of parental expectations of anticipated therapeutic behavior must take into account the purely descriptive nature and lack of factorial independence in Overall and Aronson's five category scale. For example, Overall and Aronson describe questioning the child as an example of an active orientation on the part of the therapist. At the same time, wanting the child's opinion is categorized as passive. While the categories themselves may create the impression of mutual exclusivity, the behavioral descriptions are by no means incompatible. Hence, it is understandable how parents of older children may expect both active and passive behaviors on the part of the therapist. Moreover, at varying points during the course of treatment, a parent might expect seemingly overlapping behaviors, each of which may be appropriate to a given situation. Thus, the therapist chooses to assume an active role in a crisis situation, while he may elect to remain passive when the same patient is engaging in self-exploration.

Interestingly, while there is no demonstrable relationship between race and length of stay in treatment, a discernable association was noted between social class variables and number of sessions in treatment. It would appear that education, index of social position, and, to a lesser extent, occupational status are more determinative of duration in treatment than are the demographic variables (see Table 1). In addition, the fact that children from the lower classes become involved in treatment at a later age than those from the upper classes has profound prognostic implications. It is ironic that those in our society who demonstrate the greatest need for early

intervention are the very individuals who are likely to be seen last and for the shortest period of time.

None of the five attitudes was found to be associated with length of stay in psychotherapy. Since complementary assessment of attitudes was not gathered for the therapists, it was impossible to determine whether the degree of concordance between the parent's expectation and the therapist's reported behavior might significantly affect the length of stay in treatment. We have yet to discover if fulfillment of the patient's expectations by the therapist is significantly related to (a) personal satisfaction in treatment, (b) length of stay in treatment, and (c) the qualitative effects of treatment. While the present study indicates that the nonwhite and the socioeconomically disadvantaged expect active and supportive behaviors from their therapist, there is no concrete evidence to suggest that these expectations are legitimately considered in the process of therapy.

It is well-known (if less well practiced) in the business world that the satisfied customer keeps coming back for more. Notwithstanding, we therapists somehow expect our patients to take what we have to offer without stopping to consider that our values may be utterly incomprehensible or undesirable to them. We typically deal with the patient's refusal to accept our interpretations by labelling the behavior "resistance." By so doing, we ourselves may be guilty of a similar refusal—resistance toward modifying our behavior to conform to the expectations of our patients.

REFERENCES

1. DAVIS, A. *Social Class Influences on Learning*. Cambridge, Mass.: Harvard Univ. Press, 1948.
2. GOCHMAN, D. S. Some correlates of children's health beliefs and potential health behavior. *J. Health & Soc. Behav.*, 1971, **12**, 148-154.
3. HOLLINGSHEAD, A. B., & REDLICH, F. C. *Social Class and Mental Illness: A Community Study*. New York: Wiley, 1958.
4. IMBER, S. D., NASH, E. H., & STONE, A. R. Social class and duration of psychotherapy. *J. Clin. Psychother.*, 1955, **11**, 281-284.
5. KAHN, R. L., POLLACK, M., & FINK, M. Social factors in the selection of therapy in a voluntary mental hospital. In *Mental Health of the Poor*, Reissman, F., Cohen, J., & Pearl, A., Eds. New York: Free Press, 1964.
6. MYERS, J. K., BEAN, L. L., & PEPPER, M. P. A Decade Later: A Follow-Up of Social Class and Mental Illness. New York: Wiley, 1968.
7. OVERALL, B., & ARONSON, H. Expectations of psychotherapy in patients of lower socioeconomic status. In *Mental Health of the Poor*, Reissman, F., Cohen, J., & Pearl, A., Eds. New York: Free Press, 1964. Pp. 79-87.
8. PETRONI, F. A. Correlates of the psychiatric sick role. *J. Health & Soc. Behav.*, 1972, **13**, (1), 47-54.

9. POPE, B. Socioeconomic contrasts in children's peer culture prestige values. *Genet. Psycho. Monog.*, 1953, **48**, 157-220.
10. ROSENTHAL, D., & FRANK, J. D. The fate of psychiatric clinic outpatients assigned to psychotherapy. *J. Nerv. & Ment. Dis.*, 1958, **127**, 330-333.
11. SCHAFER, L., & MYERS, J. K. Psychotherapy and social stratification. *Psychiatry*, 1954, **17**, 83-93.
12. WEINSTEIN, R. M. Patient's perceptions of mental illness: Paradigms for analysis. *J. Health & Soc. Behav.*, 1972, **13**, (1), 38-46.

University of Oklahoma Health Sciences Center

4500 North Lincoln Boulevard

Oklahoma City, Oklahoma 73104

RELATIVE CONTRIBUTIONS OF DIFFERENT SOURCES OF VARIANCE TO CONFIDENCE RATINGS*¹

Psychological Laboratories, University of Stockholm, Sweden

BO EKEHAMMAR AND DAVID MAGNUSSON

SUMMARY

The relative contributions of different sources of variance to ratings of confidence were studied. Thematic Apperception Test (TAT) stories for 46 male students were rated by four TAT experts with regard to 16 personality variables. The judges gave also a confidence rating for each personality rating. A three-way analysis of variance was applied, and the relative magnitude of the different variance sources was estimated. The main sources (Subjects, Judges, Variables) contributed together only about 10% of the total variance, whereas the different interactions plus the residual accounted for the rest.

A. INTRODUCTION

The confidence in ratings has been studied from different angles. Regarding the relationship of subjective confidence to objective accuracy, Bruner and Tagiuri (2, p. 642) summarized a discussion of previous research on the subject by saying "Some writers find a positive relationship (e. g., Odbert, 1934), some a negative one (e. g., Steinwutz, 1947), and some none (e. g., Polansky, 1941)." Kelly and Fiske (8) found that with increasing confidence there was a tendency to decreasing validity coefficients. Magnusson (9, pp. 110-118) obtained no systematic relationship between confidence and accuracy, neither across individuals nor across variables. Oskamp (11) found that objective accuracy remained at the same level with increasing amounts of subjective confidence, and Ryback (12) came to the same conclusion.

The relationship between confidence and amount of information has also been investigated. Magnusson (9, pp. 119-121) obtained a positive, significant correlation between the length of Thematic Apperception Test (TAT)

* Received in the Editorial Office on September 28, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The study was supported by a research grant from the Swedish Council for Social Science Research.

stories and the subjective confidence in TAT experts' ratings on the basis of the stories. Oskamp (11) found that the confidence of the judges increased with increasing amounts of stimulus information. Ryback (12) concluded that confidence in judgments increased linearly as a function of observation time. Magnusson and Ekehammar (10), in a study of interview data, obtained a positively monotonic relationship between interview length and confidence for both interviewers and observers.

One problem, however, that has not been investigated systematically in connection with confidence ratings is the relative contributions of different sources of variance to the ratings of subjective confidence. This problem area implies such questions as the following: Are some raters systematically more confident than others? Are some individuals or variables rated with higher confidence than others? How relatively large are the different interactions between raters, ratees, and variables? The main aim of the present investigation was to study this problem area by applying a three-way analysis of variance to ratings of confidence and to compute the relative contributions of the different sources of variance. The analysis was made on data consisting of TAT experts' reported confidence in trait ratings based on TAT protocols.

B. METHOD

1. *Subjects*

The subjects were 46 male students randomly selected from four different Swedish colleges. Their average age was 22.5 years.

2. *Judges*

The judges were four psychologists with varying clinical experience in judging TAT protocols. The judges worked quite independently of one another when performing the ratings.

3. *Variables*

Suitable and research-relevant variables were selected with the aid of TAT experts. Each variable was given unambiguous general definition. A seven-point rating scale was used with the two end-points defined by explaining words. The following 16 variables were employed: 1) Extrapunitive, 2) Ostentatious, 3) Dominant, 4) Oppositional, 5) Acute, 6) Maladjusted, 7) Scrupulous, 8) Sensitive, 9) Independent, 10) Cheerful, 11) Subjective, 12) Anxious, 13) Sociable, 14) Warmhearted, 15) Vital, 16) Intolerant.

Each judge rated all 46 protocols with regard to one of the 16 variables

before he continued to the next variable. The judges were instructed to rate those subjects first who were perceived as most extreme on the variable in question and thereafter continue to the less extreme subjects.

4. *Confidence Ratings*

The judges were instructed to rate their experienced degree of confidence for each trait rating. The confidence ratings were given on a four-point scale, where zero denoted minimal confidence and 3 denoted maximal confidence.

5. *Judgmental Data*

The TAT stories for each subject were recorded on tape and then written out. Besides the written protocols, the judges also had access to the following information about the subject: (a) age and sex; (b) age of siblings; (c) liked and disliked pictures, and their respective rank order.

6. *Method of Analysis*

A three-way analysis of variance was applied, and sum of squares (*SS*) and mean squares (*MS*) were computed for each of the variance sources: Subjects, Judges, Variables, Subjects \times Judges, Subjects \times Variables, Judges \times Variables, and the residual. As the subjects were not rerated, the residual contains, in the present case, the triple interaction, as well as error.

The relative magnitude of the different variance sources was computed according to a simple procedure suggested by Bolles and Messick (1). This method gives an estimate of the variance proportions attributable to respective sources by forming ratios of the *SS* for each source to the total *SS*. This procedure will give the same results irrespective of choice of model for the analysis of variance. Other methods are also available (*cf.* 4, 7) by which *MS* are equated to variance components through specification equations. The Bolles-Messick procedure seems to give the same outcome as these more laborious methods (*cf.* e. g., 3).

C. RESULTS

The relevant statistics of the three-way analysis of variance are given in Table 1, where the relative variance proportions of current interest are denoted *SS%*.

The variance between subjects contributed the largest variance proportion of the main sources. This result implies that some individuals are sys-

TABLE 1
ANALYSIS OF VARIANCE OF CONFIDENCE RATINGS

Source of variation	<i>df</i>	<i>SS</i>	<i>SS%</i>	<i>MS</i>
Subjects (S)	45	107.68	8.59	2.39
Variables (V)	15	23.56	1.88	1.57
Judges (J)	3	2.58	.21	.86
$S \times V$	675	251.44	20.07	.37
$S \times J$	135	126.42	10.09	.94
$V \times J$	45	49.21	3.93	1.09
Residual	2025	691.96	55.23	.34
Total	2943	1252.85	100.00	

tematically rated with higher confidence than other individuals. However, on the whole, this effect was relatively small (8.59%).

Only a small proportion (1.88%) was attributable to variation among variables, which implies that the variables were rated with about the same mean confidence. The variable given the highest mean confidence rating was No. 5 "Acute," and the variable given the lowest confidence rating was No. 15 "Vital."

The variation among judges accounted for the smallest relative proportion of the main sources. This source was quite negligible (.21%) and shows that the judges in question experienced the same degree of confidence, on the average.

The three simple interactions contributed together about a third of the total variation. The interaction of subjects with variables accounted for the largest proportion (20%) of these sources, which indicates that some individuals are more difficult to rate on some variables than other individuals. The interaction of subjects with judges accounted for about 10% of the variation. This implies that some judges experience some individuals more difficult to rate than do other judges. The interaction of variables with judges accounted for the smallest proportion (3.93%) of the simple interactions. This means that some judges, only to a small degree, have experienced some variables more difficult to judge than other judges.

Finally, the residual contributed a large proportion (*ca.* 55%) of the total variation. One must keep in mind that this term contains the triple interaction, as well as the error. The residual term was in this case somewhat larger than has been found in other studies of behavioral data employing the mode of procedure used here (e. g., 3, 5, 6).

D. DISCUSSION

The outcome of this study points to the complexity of the problem of subjective confidence and also confirms the interactional view on behavioral data. In the present case, the main sources (Subjects, Variables, Judges) contributed together only about 10% of the total variation, whereas the different interactions plus the residual accounted for the rest. Of the main sources, only that for Subjects contributed a nonnegligible part of the variation. This part was, however, smaller than two of the simple interactions. The outcome of the present analysis points to the necessity of taking all main factors (individuals, variables, judges) and their interactions into account in order to describe and predict ratings of confidence in an efficient and valid way.

REFERENCES

1. BOLLES, R., & MESSICK, S. Statistical utility in experimental inference. *Psychol. Rep.*, 1958, **4**, 223-227.
2. BRUNER, J. S., & TAGIURI, R. The perception of people. In G. Lindzey (Ed.), *Handbook of Social Psychology* (Vol. 2). Cambridge, Mass.: Addison-Wesley, 1954. Pp. 634-654.
3. EKEHAMMAR, B., MAGNUSSON, D., & RICKLANDER, L. An interactionistic approach to the study of anxiety. *Rep. from Psychol. Lab. Univ. Stockholm*, 1972, No. 362.
4. ENDLER, N. S. Estimating variance components from mean squares for random and mixed effects analysis of variance models. *Percept. & Motor Skills*, 1966, **22**, 559-570.
5. ENDLER, N. S., & HUNT, J. McV. Sources of behavioral variance as measured by the S-R inventory of anxiousness. *Psychol. Bull.*, 1966, **65**, 336-346.
6. ———. Generalizability of contributions from sources of variance in S-R inventories of anxiousness. *J. Personal.*, 1969, **37**, 1-24.
7. GLESER, G. C., CRONBACH, L. J., & RAJARATNAM, N. Generalizability of scores influenced by multiple sources of variance. *Psychometrika*, 1965, **30**, 395-418.
8. KELLY, E. L., & FISKE, D. W. The prediction of success in the VA-training program in clinical psychology. *Amer. Psychol.*, 1950, **5**, 395-406.
9. MAGNUSSON, D. A Study of Ratings Based on TAT. Stockholm: Almqvist & Wiksell, 1959.
10. MAGNUSSON, D., & EKEHAMMAR, B. Subjective confidence and interjudge agreement as functions of amount of information: A study of interview data. *Rep. from Psychol. Lab. Univ. Stockholm*, 1972, No. 366.
11. OSKAMP, S. Overconfidence in case-study judgments. *J. Consult. Psychol.*, 1965, **29**, 261-265.
12. RYBACK, D. Confidence and accuracy as a function of experience in judgment-making in the absence of systematic feedback. *Percept. & Motor Skills*, 1967, **24**, 331-334.

Psychological Laboratories

University of Stockholm

Box 6706

S-113 85 Stockholm, Sweden

DOGMATISM, ATTITUDE EXTREMITY, AND ATTITUDE INTENSITY AS DETERMINANTS OF PERCEPTUAL DISPLACEMENT*

Brigham Young University

DAVID V. STIMPSON AND JOANNE D'ALO

SUMMARY

This study examined the relationship of dogmatism, attitude extremity, and the tendency to displace perceptually a neutral communication to a position more discrepant from the subject's own than it objectively holds. Results indicate that dogmatism was not predictive of displacement tendency, but that extremity and intensity were both significantly related to displacement. It was also found that dogmatism was not correlated with having a conservative attitude on the issues studied. The results were consistent across four different attitude issues.

A. INTRODUCTION

Previous studies have demonstrated the determining influence of dogmatism (4), attitude extremity (5), and attitude intensity (5) on an individual's judgment of a persuasive communication. In general, studies of dogmatism have shown that highly dogmatic people are characterized by a tendency to avoid contact with people, events, and information that threaten the validity of their existing belief system. A study by Feather (1) supports this observation and demonstrates that highly dogmatic subjects have a preference for information consistent with their own attitudes.

Sherif and Hovland (5) have shown that people can be characterized as having a latitude of acceptance and a latitude of rejection. Individuals who hold an extreme attitude on an issue would be more likely to reject a "neutral" communication than people with less extreme attitudes, since the neutral communication would be more likely to fall outside their latitude of acceptance. Since assimilation occurs in the latitude of acceptance and contrast occurs in the latitude of rejection, individuals with extreme attitudes would be more likely to displace a neutral communication to a

* Received in the Editorial Office on September 28, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

position discrepant from their own than would people with less extreme attitudes (3).

Sherif and Hovland (5) have also shown that when an individual is highly ego-involved, the threshold of acceptance is raised and the threshold of rejection is lowered. An individual, therefore, who holds an attitude intensely would be more likely to displace a neutral statement away from his own position than would someone with a less intensely held attitude.

The present study was an attempt to assess the relative contribution of the three variables discussed above (viz., dogmatism, attitude extremity, and attitude intensity) to the tendency to displace perceptually a neutral persuasive communication. The following specific hypotheses were investigated: (a) High dogmatic subjects will displace a neutral communication more than subjects who are low on dogmatism. (b) Subjects with extreme attitudes will displace a neutral communication more than subjects with moderate attitudes. (c) Subjects with intensely held attitudes will displace a neutral communication more than subjects with mildly held attitudes.

B. METHOD

1. Subjects

A total of 91 undergraduate students enrolled in an introductory psychology course were used as subjects.

2. Instruments

Dogmatism was measured with the Rokeach Dogmatism Scale as it appears in the appendix of *The Open and Closed Mind* by Milton Rokeach (4).

Attitude extremity was measured by having subjects respond to a seven-point favorable-unfavorable continuum with reference to each of four different attitude objects: The women's liberation movement, beards on young men, socialized medicine, and the quality of our relations with Russia. Attitude intensity was assessed by having each subject indicate the degree of intensity with which each of the above attitudes was held. The degree of intensity was indicated on a seven-point continuum ranging from "very intensely" to "very mildly."

A series of "neutral" communications on each of the above attitude objects was prepared and administered to approximately 75 students enrolled in an introductory social psychology class. These students judged the communications as to their favorability-unfavorability, and the most neutral communication on each attitude object was selected for use as the neutral communication in the experiment.

3. Procedure

Subjects responded to the scales measuring the extremity and intensity of their attitudes toward the four attitude objects and then responded to the 66-item dogmatism scale. They were then presented with the four neutral communications and asked to judge them on a seven-point favorable-unfavorable continuum. Care was taken to assure that the subjects understood their task to be *judging* the communications, not expressing their own feelings or attitudes on the topics in question.

Following this procedure, the purpose of the experiment was explained to the subjects, and they were dismissed.

C. RESULTS

Examination of the data relevant to the hypotheses concerning the effects of dogmatism, attitude extremity, and attitude intensity was accomplished by means of a test selection program with a multiple regression analysis. Analysis of variance for regression was then computed for each of the three variables. These data are summarized in Table 1.

The results of this analysis indicate that dogmatism is not significantly related to attitude intensity, attitude extremity, or tendency to displace on any of the four attitude issues. Attitude extremity and attitude intensity are significantly correlated on all four issues, and both of these variables are significantly correlated with displacement on all four issues.

An additional analysis testing the finding by Hanson (2) that conservatives have higher dogmatism scores than liberals was also carried out. Since a favorable attitude on each of the four topics would be consistent with a liberal position, and an unfavorable attitude would be consistent with a conservative position, a median split was accomplished on attitude toward each of the four issues, and dogmatism scores for those with favorable *vs.* unfavorable attitudes were compared. The results appear in Table 2.

These data fail to support the proposal that subjects with a conservative attitude will be characterized by higher dogmatism scores than those with a liberal attitude.

D. DISCUSSION

The most striking thing about the data presented herein is the lack of relationship between dogmatism and any of the other variables. Attitude extremity and attitude intensity are both significant predictors of displacement, but dogmatism is not correlated with intensity, extremity, displacement, or with a rough index of conservatism. This is of particular interest

TABLE 1
CORRELATION COEFFICIENTS AMONG THE EXPERIMENTAL AND OUTCOME VARIABLES FOR ALL FOUR ATTITUDE ISSUES

Variable	Dogmatism	Attitude extremity	Attitude intensity	Displace- ment	Dogmatism	Attitude extremity	Attitude intensity	Displace- ment
<i>Women's lib</i>				<i>Beards</i>				
Dogmatism		.02	.01	.00		-.14	-.06	.04
Attitude extremity			.52**	.54**			.58**	.53**
Attitude intensity				.41**				.40**
<i>Socialized medicine</i>				<i>Relations with Russia</i>				
Dogmatism		.05	— .15	.14		.02	.09	-.01
Attitude extremity			.55**	.52**			.66**	.41**
Attitude intensity				.20**				.27**

* $p = <.05$.

** $p = <.001$.

TABLE 2
 t TEST COMPARISON OF DOGMATISM SCORES FOR THOSE HOLDING
 FAVORABLE (LIBERAL) VS. UNFAVORABLE (CONSERVATIVE)
 ATTITUDES ON THE FOUR ISSUES

Issue	Mean dogmatism scores		t
	Favorable	Unfavorable	
Womens lib	221	227	1.09
Beards	219	230	1.07
Socialized medicine	222	230	1.14
Relations with Russia	225	224	.17

in that these relationships were examined on four different attitude objects and were consistent across all four. This stability of results lends additional credibility to the outcomes.

There are three fairly obvious possible interpretations of the lack of relationship evidenced between dogmatism and the other variables in this study. One is that dogmatism is a general or background characteristic that may not manifest itself in a particular situation. The fact that four situations were examined herein makes this interpretation somewhat unattractive. A second possibility, which is really an extension of the first, is that dogmatism is situation specific and was not tapped by the attitude objects used in this study. And the third possibility is that dogmatism is not a useful predictor variable. Whichever of the three is correct, the value of dogmatism scores in predicting attitude variables must be seriously questioned.

On the other hand, both attitude extremity and attitude intensity appear to be good predictors of the tendency to distort perceptually or displace the content of a communication.

REFERENCES

1. FEATHER, N. T. Preference for information in relation to consistency, novelty, intolerance of ambiguity, and dogmatism. *Austral. J. Psychol.*, 1969, 21, 235-247.
2. HANSON, D. J. Dogmatism and attitude extremity. *J. Soc. Psychol.*, 1973, 89, 155-156.
3. HOVLAND, C. I., HARVEY, O. J., & SHERIF, M. Assimilation and contrast effects in reactions of communication and attitude change. *J. Abn. & Soc. Psychol.*, 1957, 55, 244-252.
4. ROKEACH, M. *The Open and Closed Mind*. New York: Basic Books, 1960.
5. SHERIF, M., & HOVLAND, C. I. *Social Judgment*. New Haven, Conn.: Yale Univ. Press, 1961.

Department of Psychology
 Brigham Young University
 1240B SFLC
 Provo, Utah 84601

THE EFFECTS OF NEGATIVE AFFECT CONDITIONS AND CONCEPT INVOLVEMENT ON LANGUAGE REDUNDANCY*

University of Massachusetts

RICHARD L. CONVILLE AND VERNON E. CRONEN

SUMMARY

Subjects provided free responses to six concepts representing varying degrees of involvement. Responses were obtained from each subject under normal and negative affect conditions. Group data were used. Under negative affect conditions, significant correlations were found between concept involvement and type/token ratio (TTR), tokens per type, response variation index (RVI), and total types. Correlations were in the direction of *increased redundancy as involvement decreased* and, conversely, *increased response variation as involvement increased*. These relationships held only under negative affect conditions. Implications were discussed for the problems of communication under negative affect conditions and the assessment of individuals' internal states from verbal behavior. Finally, a sociolinguistic view of the "language community" concept was offered.

A. INTRODUCTION

Psycholinguistics has been primarily concerned with the study of intrapersonal language behavior and the antecedent conditions that influence individual language behavior. This emphasis on individual behavior reflects the view of Chomsky and his followers that linguistics is itself a branch of cognitive psychology (4). The continuing growth of interest in interpersonal relations in psychology and communication, however, suggests the need to expand the study of language behavior to include greater emphasis on interpersonal language behavior. The present state of affairs in research was accurately described by Moscovici when he asserted that what we usually get is either "language without communication or communication without language" (18, 226).

According to Newman, psycholinguistics came into being as a field "when psychologists discovered language and linguists discovered that

* Received in the Editorial Office on September 28, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

people use it" (19). And it may also be fairly said that sociolinguistics owes its recent prominence to a further "discovery": that people use language to *communicate* within and between language-using *communities*.

Because language-using communities are composed of language-using *individuals*, the orientations of psycho- and sociolinguistics should be complementary. Conville (6) has recently proposed a research paradigm that emphasizes the need to expand our research interests to encompass (a) the effects of antecedent conditions on the individual's language behavior and (b) the effects of those language behaviors on others. One excellent example of the extension of psycholinguistic and intrapersonal data to sociolinguistic and interpersonal contexts is provided by the research derived from Rokeach's personality variable of open *vs.* closed mindedness. A number of researchers have investigated the relationship of closed mindedness to the production of opinionated language *and* the relationship of opinionated language use by communicators to attitude change in receivers (1, 15, 16, 17).

The purpose of this study is to begin the exploration of the sociolinguistic implications of Osgood's language redundancy hypothesis. Osgood (20) has presented data to support the hypothesis that language produced under conditions of negative affect will be more redundant than language produced under normal conditions. This finding is consistent with those of other researchers (7, 11, 12, 13). When one attempts to apply this finding to the broad range of interpersonal communication, however, one faces several problems. First, Osgood's findings, like those of other researchers, were based on individual, not group data. This is most important because from a sociolinguistic viewpoint our interest is in the available verbal repertoire of a *group* as a language-using community, not in averages of individual repertoires. If each individual's responses are more redundant under conditions of negative affect, as Osgood says, we still do not know whether each individual's constricted repertoire of responses is highly peculiar to him. That is, even if response redundancy increases for each individual, the idiosyncrasy of group responses could still increase, thereby fragmenting the group and inhibiting consensus. Therefore, individual data on redundancy give no hint as to the functioning of a group.

Second, prior research has ignored the question of the *kind* of concept being considered by persons under negative affect conditions. People may speak about trivial or involving concepts. [The communication and attitude change literature has made important use of the concept-involvement variable for predicting attitudinal responses (21).] Osgood's work on suicide

notes seems to show a relationship between increased redundancy and high concept involvement if we accept the intuitively reasonable assumption that the concept of one's own suicide is involving. However, evidence against this assumption comes from several sources. For example, Wechsler's (24) case study of his son's struggle with mental illness and suicide indicates that the victim's demeanor immediately prior to suicide was one of tranquility and relief. The detailed reporting of Case 10, Mrs. M., by McCulloch and Philip (14) revealed a similar sequence of events, with the victim appearing "bright, cheery, calm" two days before suicide. The very night of suicide the victim was partying with three friends. Finally, Shneidman and Farberow (22) have reported empirical data supporting the same conclusion. They compared 33 genuine with 33 fake suicide notes, using Mowrer's Discomfort-Relief Quotient. The notes did not differ significantly on the number of relief (or positive affect) statements. However, the genuine notes had significantly more discomfort (or negative affect) statements and significantly more neutral (nonaffective) statements. In other words, the genuine notes expressed more negative affect but at the same time did it in a more objective manner than did the fake notes. Thus it is reasonable to question whether Osgood was testing reactions to a high or low involvement concept.

The final difficulty is with the descriptive nature of the prior literature. Prior researchers provided no way to isolate and control concept involvement effects apart from the conditions surrounding the concepts that elicit verbal responses. Our experimental procedure was designed to allow us to *impose* conditions of negative affect and, when imposed, hold the conditions constant across concepts. We also varied concept involvement under normal and negative affect conditions.

In the absence of a clear basis for a directional hypothesis the following nondirectional hypothesis was formulated. *H*: Level of concept involvement will have a differential effect on the redundancy of group responses depending on the presence of negative affect conditions. While our hypothesis is stated in terms of "redundancy," it could just as well be stated in terms of "response variation" or "response idiosyncrasy." These two latter terms simply represent the obverse of redundancy for our grouped data.

B. METHOD

1. *Subjects and Procedures*

Subjects were students in Psychology 101 at the University of Massachusetts, Amherst, who volunteered to participate in two testing sessions.

Thirty-four subjects completed both sessions. In the first session, subjects took two tests in booklet form. The first test was designed to operationalize the involvement variable. Recent studies have provided data that raise serious question as to the validity of most of the frequently employed involvement measures including own-categories, Diab's semantic differential method, and ordered alternatives (5, 25). Therefore the researchers proceeded in accord with the suggestion of Clark and Stewart (5) who advocated more direct measurement techniques. One such direct technique was developed by Fulton (8). The method involves three simple face-valid scales: How important *should* this concept be to you? (very important-very unimportant); How important *is* this concept to you? (very important-very unimportant); How much do you *care* about this concept? (a great deal-very little). Each question was answered on a seven interval scale. The first question was *not* included in the scoring. It functioned only to force Ss to separate "should" from "is." Total range for scores on the instrument was therefore 2-14. In addition to face validity, Fulton has reported a reliability coefficient of .89. Ss rated six concepts selected by the experimenters to represent degrees of involvement: Rabbits, Muskie, Newspapers, Love, Freedom, and Politics. Table 1 indicates that these concepts did represent a large range of involvement levels.

The second booklet presented the six concepts as attitude objects, one to a page. The order of pages in booklets was randomized. Below each concept were 16 lines. Subjects were instructed to "write down the beliefs, expectancies, ideas, etc. that you associate with the concept at the top. Write them down *in the order* they occur to you. Write down as many ideas as you can think of. Write only one idea or association per line." This session represented the "normal" testing condition.

A second session was held 10 days later to produce conditions of negative affect under which subjects could respond to the same six stimulus concepts. Subjects were randomly assigned to two groups and convened in different rooms. Following an adapted version of the techniques employed by Carmichael and Cronkhite (3) and Carmichael (2), situational stimuli were introduced to produce negative affect. Both groups received the same treatment. Each group was told that it would have to repeat part of the first session's work because the data had been misplaced. They were told that their responses were more vital to the experiment than the other group's because they were the "low" group, "that is, on the basis of entrance tests and reports of instructors, you are expected to do less well academically than your peers." The personnel administering the second session followed

a well rehearsed manuscript causing them to treat Ss as children. Subjects' booklets were checked to be sure ID numbers were in the proper corner. Stern admonitions were given about "doing your own work" and "no talking." The test booklets used were dittoed in careless fashion with strikovers and misspellings in contrast to the neat mimeographed booklets of the first session. Thus they looked hastily put together in response to the "loss" of the data. Interviews conducted after the second session confirmed the success of the manipulation in causing subjects to feel highly negative about their condition. All subjects were then thoroughly debriefed.

2. *Dependent Measures*

Four dependent language measures were used: (a) the type/token ratio (TTR) or the ratio of different words to total words; (b) the inverse of the type/token ratio (tokens/type) or the mean number of times each different word was used (c) the response variation index (RVI) or the mean number of different words used by each subject (9); and (d) the total types (types) or different words produced by all 34 subjects. The last three of these measures are all designed to tap the opposite of redundancy or what we chose to call the idiosyncrasy of responses.

C. RESULTS

Group data were employed in this study. Results were analyzed by Pearson product-moment correlation. The .05 level was set for the rejection of the null hypothesis.

The raw data are presented in Table 1 and the correlations in Table 2. The hypothesis of an interaction between redundancy and level of negative affect was supported by all four dependent measures. The TTR was not significantly correlated with involvement under normal conditions (T_1), whereas TTR was significantly correlated with involvement under negative affect conditions (T_2). The high positive correlation in T_2 ($r = .82$, $p < .05$) indicated that the direction of the interaction was toward *higher* redundancy under conditions of negative affect for low involvement topics, but toward *lower* redundancy under negative affect conditions for high involvement topics. These results indicate that the usual prediction of increased redundancy of verbal responses under conditions of negative affect (7, 11, 12, 13, 20) held for low involvement topics but not for high involvement topics. On the other hand, the results also indicate that idiosyncrasy of responses increased with increased involvement for high but not for low involving topics under negative affect conditions.

TABLE 1
RAW DATA: INVOLVEMENT \times REDUNDANCY MEASURES

Concept and involvement level	TTR (T_1)	TTR (T_2)	RVI (T_1)	RVI (T_2)	Tokens/ type (T_1)	Tokens/ type (T_2)	Types (T_1)	Types (T_2)
Love (12.84)	.64	.66	7.68	6.53	1.56	1.51	261	222
Freedom (11.93)	.57	.60	7.91	7.59	1.76	1.67	269	258
Newspapers (8.49)	.59	.57	6.62	5.65	1.68	1.77	225	192
Politics (8.12)	.70	.62	7.91	6.44	1.44	1.62	269	219
Muskie (7.37)	.54	.49	5.85	5.50	1.98	2.11	199	187
Rabbits (6.05)	.50	.47	4.85	4.74	1.86	2.03	173	161

Note: Explanations of terms used in the table are as follows. Involvement level = scores ranged from 2 to 14; TTR = type/token ratio, the ratio of different words to total words; RVI = response variation index, the mean number of different words used by each subject; tokens/type = the mean number of times each different word was used; types = number of different words produced by all subjects; T_1 = normal conditions; T_2 = negative affect conditions.

TABLE 2
CORRELATIONS: INVOLVEMENT \times REDUNDANCY MEASURES

Redundancy measures	1	2	3	4	5	6	7	8	9
1. Involvement	—	.40	.82*	-.46	-.82*	.77	.83*	.77	.83*
2. TTR (T_1)		—	.84*	-.99**	-.84*	.81*	.51	.81*	.51
3. TTR (T_2)			—	-.88*	-.99**	.93**	.77	.93**	.77
4. Tokens/type (T_1)				—	.88*	-.84*	-.54	-.83*	-.54
5. Tokens/type (T_2)					—	-.94**	-.79	-.95**	-.79
6. RVI (T_1)						—	.91**	.99**	.91**
7. RVI (T_2)							—	.91**	.99**
8. Types (T_1)								—	.91**
9. Types (T_2)									—

Note: Significance levels are based on $n = 6$ concepts; $df = 4$. Definitions of abbreviations are as follows. TTR = type/token ratio, the ratio of different words to total words; tokens/type = the mean number of times each different word was used; RVI = response variation index, the mean number of different words used by each subject; types = number of different words produced by all subjects; T_1 = normal conditions; T_2 = negative affect conditions.

* .05 = .811.

** .01 = .917.

This same pattern of findings was repeated for the three other measures. One would, of course, expect as much with the tokens/type measure, the mean number of times each different word was used. The significant negative correlation with involvement level in T_2 ($r = -.82$, $p < .05$) indicated that under negative affect conditions, as involvement level *increased*, the mean number of times each different word was used *decreased*, but as involvement level *decreased*, the mean number of times each different word was used *increased*. Perhaps more clearly than the TTR data, these results indicate that under conditions of negative affect, the variety or idiosyncrasy of group responses increased as involvement level increased.

Concerning the response variation index (RVI), the significant positive correlation ($r = .83$, $p < .05$) indicated that, under conditions of negative affect, an increased involvement level was positively associated with an increased average number of words produced by each subject.

As for types, or total number of different words produced by all subjects, the significant positive correlation with involvement ($r = .83$, $p < .05$) again indicated an *increase* in the consensual nature of responses for low involvement topics and an *increase* in the idiosyncratic nature of responses for high involvement topics, results not obtained under normal conditions.

D. DISCUSSION

The interaction of concept involvement and negative affect conditions seems important for several reasons. First, the findings should be especially crucial to those researchers and therapists who use subjects' immediate verbal responses as indices of their internal states. Under conditions of negative affect the observation of high redundancy may be a key to the subject's low level of involvement with the concepts under discussion. These results seem to suggest that the high redundancy of suicide notes reported in prior research (20) reflects not only negative affect conditions and consequent heightened drive, but also the disengagement of the victim from personal involvement in his own death. This conclusion is particularly telling in light of the fact that our conditions of negative affect plus disengagement amount to a virtual replication of the Shneidman and Farberow (22) results using the Discomfort-Relief Quotient. Our data show that increased redundancy was a function of *reduced* concept involvement *plus* negative affect conditions. No significant relationship was found between redundancy and involvement under normal conditions. While such negative findings are of course inconclusive, they suggest that redundancy might not be produced by negative affect conditions alone.

Second, these findings also bear directly on the problem defined by Moscovici as "language without communication and communication without language." To illuminate our point it is conceptually clearer to speak of the obverse of response redundancy—response diversity or response idiosyncrasy. The three idiosyncrasy measures (RVI, tokens/type, tokens) indicated that under negative affect conditions, there was *less communality of response among the pooled subjects as involvement with the concept increased* and more communality of response as involvement decreased. This finding suggests that, under stress, people tend to generate more responses to involving concepts that are *not common* to their fellow communicants and, conversely, more responses that *are common* to their fellow communicants when the concepts are not involving.

Put another way, it was as if the subjects in the high involvement negative affect condition were drawing responses from a larger pool of possible responses than the subjects in the low involvement negative affect condition. As involvement increased, the pool got larger; thus the greater average number of different words used by each subject and the lesser the likelihood of repeating the same words. Under normal conditions, it seems the hypothetical pool of available responses (types) changed size randomly as involvement increased.

Finally, we also see these findings as suggestive of a uniquely sociolinguistic view of language community. "Language community" may have to be viewed as a much more fluid concept than is common in the literature, for "community" seems to depend on the immediate social situation (in this case, normal *vs.* negative affect conditions). If we view language as the "glue" of a culture or a subculture, as the defining characteristic of any group, then the subjects in this experiment were much more a group, a community, under negative affect-low involvement conditions than they were under negative affect-high involvement conditions.

There are several implications of this perspective. For one thing, to view language community as a continuum depending on the social situation is certainly more consistent with a process view of social reality than is a static definition. For another, the results may shed light on the process of group functioning. One would expect for example, that a group with great idiosyncrasy of verbal responses among members would tend to operate less than efficiently. There is evidence to show that the degree to which meaning is shared is directly related to the ability of people to communicate successfully (23). The experimental methods used in this study lend themselves well to such inferences about shared meaning because the form of responses

provided by subjects closely parallels the procedures used by Greenwald (10) in his studies of attitudes toward concepts. Greenwald found that free verbal responses in the form of "thought listing" as used in this study provide a dependable index of attitudes toward a topic at a given time. We may safely assume, therefore, that under negative affect, as opposed to normal conditions, the results of this study show a dissipation of shared meaning within the pool of experimental subjects as involvement level increased.

It is acknowledged that this study does not utilize the full paradigm for sociolinguistic research introduced earlier (6), for it does not include a direct measure of the communication consequences of redundancy/diversity levels. Future research should be directed toward an assessment of the social function of redundancy/diversity levels, given their origins in negative affect and involvement.

REFERENCES

1. BASEHART, J. Message opinionation and approval-dependence as determinants of receiver attitude change and recall. *Speech Monog.*, 1971, **38**, 302-310.
2. CARMICHAEL, C. W. Frustration, sex, and persuasability. *West. Speech*, 1970, **34**, 300-307.
3. CARMICHAEL, C. W., & CRONKHITE, G. L. Frustration and language intensity. *Speech Monog.*, 1965, **32**, 107-111.
4. CHOMSKY, N. *Language and Mind*. New York: Harcourt, Brace & World, 1968.
5. CLARK, R. A., & STEWART, R. Latitude of rejection: A measure of ego involvement. *Speech Monog.*, 1971, **38**, 228-234.
6. CONVILLE, R. L. Socialization, language behavior, and communication. Paper read at the Linguistic Society of America Summer Conference, Ann Arbor, Michigan, August 3-5, 1973.
7. FAIRBANKS, H. The quantitative differentiation of samples of spoken language. *Psychol. Monog.*, 1944, **56**, 19-38.
8. FULTON, R. B. Attitude change: A homeostatic model of the listener. Ph.D. dissertation, University of Illinois, URBANA, 1968.
9. GOSS, B. The effect of sentence context on associations to ambiguous, vague, and clear nouns. *Speech Monog.*, 1972, **39**, 286-289.
10. GREENWALD, A. G. Cognitive learning, cognitive response to persuasion, and attitude change. In A. G. Greenwald, T. C. Brock, and T. M. Ostrom (Eds.), *Psychological Foundations of Attitudes*. New York: Academic Press, 1968.
11. HÖWELE, M. Diversity of word usage as a stress indicator in an interview situation. *J. Psycholinguis. Res.*, 1972, **1**, 243-248.
12. JAFFE, J. Dyadic analysis of two psychotherapeutic interviews. In L. A. Gottschalk (Ed.), *Comparative Psycholinguistic Analysis of Two Psychotherapy Interviews*. New York: Internat. Univ. Press, 1961.
13. MANN, M. B. The quantitative differentiation of samples of written language. *Psychol. Monog.*, 1944, **56**, 41-74.
14. MCCULLOCH, J. W., & PHILIP, A. E. *Suicidal Behavior*. Oxford, Eng.: Pergamon Press, 1972.
15. MEHRLEY, R. S., & MCCROSKEY, J. C. Opinionated statements and attitude intensity as predictors of attitude change and source credibility. *Speech Monog.*, 1970, **37**, 47-52.

16. MILLER, G. R., & BASEHEART, J. Source trustworthiness, opinionated statements, and response to persuasive communication. *Speech Monog.*, 1969, **36**, 1-7.
17. MILLER, G. R., & LOBE, J. Opinionated language, open- and closed-mindedness, and response to persuasive communications. *J. Commun.*, 1967, **17**, 333-341.
18. MOSCOVICI, S. Communication processes and the properties of language. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*. New York: Academic Press, 1967.
19. NEWMAN, J. B. Pluralism and diversity in the field of speech communication. Lecture at the University of Massachusetts, Amherst, April 27, 1972.
20. OSGOOD, C. E. Some effects of motivation on style of encoding. In T. A. Sebeok (Ed.), *Style in Language*. Cambridge, Mass.: MIT Press, 1960.
21. SHERIF, C. W., SHERIF, M., & NEBERGALL, R. E. *Attitude and Attitude Change*. Philadelphia: Saunders, 1965.
22. SHNEIDMAN, E. S., & FARBEROW, N. L. The logic of suicide. In E. S. Shneidman & N. L. Farberow (Eds.), *Clues to Suicide*. New York: McGraw-Hill, 1957. Pp. 35-40.
23. TRIANDIS, H. C. Some determinants of interpersonal communication. *Hum. Relat.*, 1960, **13**, 279-287.
24. WECHSLER, J. A. *In a Darkness*. New York: Ace, 1972.
25. WILMOT, W. W. A test of the construct and predictive validity of three measures of ego involvement. *Speech Monog.*, 1971, **38**, 217-227.

Department of Communication Studies

University of Massachusetts

Amherst, Massachusetts 01002

THE RELATIONSHIP OF POLITICAL ORIENTATION TO THE VALUES OF FREEDOM AND EQUALITY*

Department of Educational Psychology, Indiana University

DANIEL J. MUELLER

SUMMARY

Rokeach (3) found that while liberal Democrats and conservative Republicans cluster at opposite ends of an equality value continuum, they both have high freedom values. Using Equality and Freedom value scales constructed specifically for this study, the writer found that conservative Republicans scored significantly below liberal Democrats on both the Equality and the Freedom value. The contradiction with Rokeach's findings is explained by the abstract nature of the value descriptors utilized by Rokeach. It is suggested that while conservative Republicans are strong proponents of freedom as an abstract ideal, their behavioral referents for this value are much more restricted than are those of liberal Democrats.

A. INTRODUCTION

Rokeach (3) has proposed a two-dimensional model for explaining "all the major variations among various political orientations" (p. 171). He suggests that positions along the very muddy and imprecise "liberal-conservative" continuum which is commonly used to identify political orientation can be defined more accurately and with greater conceptual clarity if two value dimensions, Freedom and Equality, are used in place of this dimension. Researching from his model, Rokeach demonstrated that Socialists and liberal Democrats are high on both the Freedom value and the Equality value. Nazis, he found, are low on both values. Communists are high on the Equality value, but low on Freedom; and conservative Republicans are high on Freedom, but low on Equality.

In measuring these values Rokeach uses two methods. With live and available subjects he employs his Value Survey (2) on which Ss rank order 18 values (Freedom and Equality are among the values to be ordered). The ranking of each value then becomes the respondent's score on that value.

* Received in the Editorial Office on October 2, 1973, and published immediately at Provincetown, Massachusetts. Copyright by the Journal Press.

Rokeach's other method of measuring values involves content analysis. When Ss are not living or are not available for experimentation, Rokeach collects their writings and simply notes the incidence of "favorable mention" of each of the values in equal length passages.

While Rokeach has demonstrated the reliability of his value measurement methods, the writer is unsatisfied with their validity.¹ In Rokeach's content analysis method of value measurement a single word (e. g., Freedom) is the total descriptor for each value. When his Value Survey is administered, brief synonyms "define" each value (e. g., "Freedom" is delimited by "independence, free choice"). It has not been demonstrated that these brief abstract descriptors for each value have a constant meaning across Ss. It may be, rather, that while conservative Republicans and liberal Democrats have an equal incidence of favorable mention of Freedom, adherents to these political orientations do not define freedom similarly at a behavioral level.

The purpose of the present study is to test Rokeach's two-dimensional political orientation theory with use of a value measurement instrument with higher content and construct validities than Rokeach's value measurement methods. More specifically, liberal Democrats and conservative Republicans were compared on the Freedom and Equality values by means of a method of value measurement in which these values are assigned the same behavioral meanings across Ss.

B. METHOD

The first step in carrying out the study was the construction of Freedom and Equality scales that are highly reliable and for which some kind of validity is demonstrable. Students in a graduate Social Psychology class were charged with submitting items that they thought were indicative of the two values. This pool of 62 items was edited by the writer and administered to 69 graduate students in Education. All items utilized four-response, Likert-type alternatives ("strongly agree" through "strongly disagree").

Sample members were also asked to indicate their political preference: liberal Democrat, moderate Democrat, Independent, moderate Republican, or conservative Republican. Item analysis indicated that both scales had high internal consistency ($\alpha = .78$ for the 27 item Equality scale and

¹ In a separate study (1) the author administered Rokeach's Value Survey, together with the Equality and Freedom scales whose construction is described above, to a sample of 60 graduate students in Education. Rokeach's and the author's Equality scales inter-correlated .39; Rokeach's and the author's Freedom scales correlated .25. These inter-correlations indicate that very small proportions (15% and 6%, respectively) of the total variances of these scales are shared by their counterpart scales.

.90 for the 35 item Freedom scale) and identified items not substantially correlated with their respective total scale scores (which were subsequently deleted).

One-way ANOVAs comparing mean scores of the various political orientation groups on the two scales indicated significant differences ($p < .001$) among groups, with liberal Democrats scoring highest and conservative Republicans scoring lowest on *both* scales. (Rokeach would predict no significant difference on the Freedom value.) Upon inspection of the Freedom scale, it was noted that this scale included not only items concerning "democratic" freedoms (e. g., freedom to live anywhere, freedom to enter any profession, freedom of public expression), but also items concerning illegal and "immoral" freedoms (e. g., sexual freedom, freedom to smoke marijuana).

At this point the writer speculated that perhaps conservative Republicans scored low on the Freedom scale because they opposed "freedom to sin," and hypothesized that if the "immoral" freedom items were removed from that scale, the conservative Republicans would score as high as the liberal Democrats. Ten "freedom to sin" items were identified and consequently removed from the Freedom scale to form a third scale called License value. The final scales were rescored in the standardization sample, and subsequently all three scales were administered to a cross-validation sample of 61 graduate students in Education.

C. RESULTS AND DISCUSSION

Table 1 shows internal consistency coefficients for each of the scales in both administrations. These coefficients are substantially high, especially for relatively short, noncognitive scales. The slightly lower coefficients for all three scales in the cross-validation sample resulted from slightly smaller variances in this sample.

Table 2 lists mean scores for each political orientation group on the three scales in both the standardization and cross-validation samples. Comparison of mean scores by one-way ANOVA indicates differences among groups on

TABLE 1
INTERNAL CONSISTENCY (ALPHA) COEFFICIENTS FOR THE
THREE VALUE SCALES IN TWO SAMPLES

Sample	N	Equality (K = 22)	Freedom (K = 23)	License (K = 10)
Standardization	69	.85	.84	.86
Cross-validation	61	.77	.75	.78

all three scales, in both administrations, significant at the .001 level. In every case liberal Democrats scored highest, and conservative Republicans lowest. Contrary to Rokeach's theory and his research findings, the findings of the present study indicate that when Freedom is taken out of the abstract, conservative Republicans score considerably lower on this value than do liberal Democrats.

In retrospect this finding does not seem particularly startling. Conservative Republicans more often have well established economic and status interests to protect than do liberal Democrats. If anyone is allowed to live anywhere, and if anyone is allowed to become a member of any professional or occupational group, and if anyone is allowed to achieve advanced educational degrees, these vested economic and status interests will be threatened. Furthermore, the legitimacy of these interests is securely underpinned by a complex philosophic and moral system. If anyone is allowed to say anything, publicly, this philosophic and moral system will be threatened. It is indeed quite possible that conservative Republicans are not as vibrant proponents of "democratic" freedoms as are liberal Democrats.

It is also interesting to note that on two out of three scales in the standardization sample, and on all three of the scales in the cross-validation sample, respondents identifying themselves as Independent scored much closer to liberal Democrats than to conservative Republicans. Another interesting configuration occurred in the cross-validation sample, where moderate Democrats and moderate Republicans scored very close to one another on all three scales.

While Rokeach's findings appear to have been confuted in the present study, a replication is in order. Two qualifications limit the generalizability

TABLE 2
MEAN SCORES OF EACH POLITICAL ORIENTATION GROUP ON THE THREE VALUE SCALES

Scale	Liberal Democrat	Moderate Democrat	Independent	Moderate Republican	Conservative Republican	F ratio
<i>Standardization sample</i>						
	(N = 18)	(N = 7)	(N = 17)	(N = 18)	(N = 8)	
Equality	74.33	69.29	67.00	62.28	60.63	7.83*
Freedom	70.50	67.14	67.47	60.28	53.88	8.54*
License	33.22	31.71	33.00	26.83	25.25	6.44*
<i>Cross-validation sample</i>						
	(N = 11)	(N = 12)	(N = 16)	(N = 17)	(N = 5)	
Equality	71.45	61.67	67.94	63.41	53.20	10.98*
Freedom	71.64	62.92	67.69	61.00	58.20	8.57*
License	34.82	28.00	33.00	26.76	24.60	14.58*

* $p < .001$.

of the findings of this study. The samples are only moderate in size and somewhat restricted (graduate students in Education). Secondly, the accuracy of the single-item, self-report political orientation measure has not been established. Nonetheless, the fact that the same results occurred in both samples and that mean differences were all significant at such an extreme level (.001) is clearly evidence in contradiction to Rokeach's theory.

REFERENCES

1. MUELLER, D. J. A test of the validity of two scales on Rokeach's Value Survey. *J. Soc. Psychol.*, in press.
2. ROKEACH, M. Value Survey. Sunnyvale, Calif.: Halgren Tests, 1967.
3. ———. Beliefs, Attitudes, and Values. San Francisco: Jossey-Bass, 1969. Pp. 171-178.

Department of Educational Psychology
Indiana University
Bloomington, Indiana 47401

THE EFFECT OF CONTINGENT SHOCK (PUNISHMENT) ON THE PERFORMANCE OF A PAIRED-ASSOCIATES LEARNING TASK*

Angelo State University and University of Texas

JERRY W. THORNTON AND GEORGE D. POWELL

SUMMARY

Two groups of Ss were tested for recall of functional stimuli after having learned a list of paired associates to criterion. One group received shock contingent upon incorrect association, while a second group received no shock during the acquisition of the paired associates. The group given shock contingent upon incorrect responses recalled significantly fewer of the associates than the no shock group. The differential effects of shock due to contingency were discussed.

A. INTRODUCTION

Various levels and types of drive (*D*) have been investigated as an independent variable in verbal learning. The effect of *D* has been equated with levels of manifest anxiety (5, 7) and with shock levels (3). Shock and anxiety levels were studied in a factorial design by Besch (2) and Lee (6). Lee (6) found that an increase in *D* either induced by electric shock or in terms of manifest anxiety significantly facilitated learning when the dominant habit was correct. Chiles (3) also found that Ss receiving shock learned a verbal learning task in fewer trials and made fewer errors than did Ss not shocked. In both cases, shock was administered to Ss noncontingent on their performance on the verbal learning task. Besch (2) found, however, that Ss given shock showed a decrement in learning in comparison to a non-shock group when habit was strong (noncompetitive list). The Ss in this study were told "to expect shocks if they made too many errors." Thus shock in Besch's study can be considered to have been contingent on S's performance on the verbal learning task.

The purpose of the present investigation was to examine the effects of learning a low habit paired-associate (P-A) list with punishment (electric shock) delivered for incorrect or omitted responses (i. e., task relevant or

* Received in the Editorial Office on October 2, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

contingent shock). In line with Easterbrook's (4) attention reduction theory, it was hypothesized that shocking Ss for incorrect responses would increase *D* in acquisition and thus restrict the range of attention to the specific functional stimulus (i. e., incidental learning reduction) relative to a nonshock control. Because of functional cue utilization by the high *D* Ss, acquisition was predicted to proceed more rapidly than the P-A acquisition of a nonshock control. It was also hypothesized that recall of responses to given functional single stimuli would be less for the group receiving contingent shock than for the no shock group.

B. METHOD

1. Subjects

The Ss were 36 introductory psychology volunteers who participated in the experiment as part of an undergraduate course requirement. The Ss were randomly assigned, 18 each, to one of two conditions: Contingent Shock (CS) and No Shock (NS).

2. Materials

The P-A list consisted of trigram stimuli randomly drawn from the consonants of the alphabet without replacement to form seven completely non-redundant CCCs. The CCCs were checked against Witmer's (8) CCC norms to insure less than 30% meaningfulness. Response items for these seven stimuli were the numbers 2 through 8.

3. Procedure

All Ss were read the general instructions describing the nature of the task. The Ss in the CS group were read instructions explaining the contingency of shock relative to their performance and were allowed to adjust the level of shock to an irritating but not painful level. They were given one practice trial on the P-A list without shock. On the second and subsequent trials, Ss were shocked for incorrect or omitted responses on the list. The Ss in the NS group performed the P-A task without shock. All Ss continued P-A training to a criterion of two perfect recitations. Shock was generated by a Grason-Stadler shock generator (average over trials was 1 ma at 350 VAC).

The P-A anticipation method was used, and the stimuli and responses were presented to individual Ss on a Lafayette memory drum at 2:2:4 sec rate with four list orders to avoid serial learning. All Ss were asked to recall (self-paced) the response number for the trigram stimulus which consisted of an individual consonant presented to Ss on a 3 × 5 index card. The Ss were presented individual stimulus letters of each trigram in one of three

orders: one third were tested on initial letters first, then on medial letters, and then on final letters; another third on medial, final, and initial letters; and another third on final, initial, and then medial letters. After the single letter recall, all Ss received S-R, R-S counterbalanced recall (with use of the total three-letter stimulus and response).

C. RESULTS

1. Acquisition

The two groups did not significantly differ in trials to criterion $\bar{X}_{CS} = 12.05$, $\bar{X}_{NS} = 13.08$, $t(34) = -1.34$, $p > .05$; omission errors $\bar{X}_{CS} = 10.20$, $\bar{X}_{NS} = 10.80$, $t(34) = -.42$, $p > .25$; or intrusion errors $\bar{X}_{CS} = 24.13$, $\bar{X}_{NS} = 29.13$, $t(34) = -1.12$, $p > .05$.

2. Recall

The means and standard deviations for the CS group for each stimulus letter position were as follows: Letter 1 $\bar{X} = 2.44$, $SD = 2.08$; Letter 2 $\bar{X} = .94$, $SD = .94$; Letter 3 $\bar{X} = 1.83$, $SD = 1.30$. For the NS group they were Letter 1 $\bar{X} = 4.28$, $SD = 1.53$; Letter 2 $\bar{X} = 2.17$, $SD = .92$; and Letter 3 $\bar{X} = 2.67$, $SD = 1.78$.

The recall data were subjected to a mixed effects $2 \times 3 \times 3$ ANOVA. There was a significant difference between the CS and NS conditions in total number of responses recalled given only one letter of the stimulus word, $F(1,30) = 17.05$, $p < .01$ (i. e., the CS group recalled significantly fewer of the responses than the NS group). The analysis of the differential effect of individual stimulus letters in recalling the correct response was significant $F(2,60) = 6.92$, $p < .05$. Although the meaning of these data is somewhat questionable in light of Berry and Baumeister (1), the Newman-Keuls test revealed the first letter within the stimulus word to be significantly more efficient ($p < .05$) than either the second or third letter, which were not statistically different, in evoking a correct response. The presentation order effect on recall was nonsignificant $F(2,120) = 1.13$, $p > .05$. All interactions were nonsignificant ($ps > .10$).

The S-R, R-S counterbalanced recall data (total three-letter stimulus and response) revealed for the CS group S-R = 100% and R-S = 10%, and for the NS group S-R = 100% and R-S = 40%, a difference in R-S recall between CS and NS Ss that was significant $t(34) = 1.89$, $p < .05$.

D. DISCUSSION

The results appeared to support the Easterbrook hypothesis of cue utilization. The CS group did take fewer trials (though not significant) to acquire the P-A list than the NS group. The CS group tended to recall responses to

single letter stimulus letters more on a functional cue selection basis than the NS group. The CS Ss had fewer correct recall responses over the 21 single stimulus letters than did the NS Ss (which was considered as evidence for the CS Ss' reliance on a functional stimulus), while the NS Ss appeared less likely to rely on a functional (one-letter) stimulus. The R-S (total stimulus) recall also suggested that CS Ss relied on a functional stimulus (e. g., R-S recall was only 10%) and the NS Ss relied to a lesser degree on functional stimulus (e. g., R-S recall was 40%).

The data appear to support the theory that increased *D* with a low habit results in more rapid learning. The present study suggests, however, that criterion for correctness of response should also be an important consideration. The present study counted functional selection as correct, and thus incidental learning was at a minimum. Other investigations may utilize a task where functional selection is not appropriate: i. e., where the intentional task includes many potential incidental cues (e. g., Ss could learn to criterion by a strategy that eliminates the use of several aspects of the task and still be incorrect in recall). It appears possible that some of the contradictory reports in stress research may be due to a confounding of criteria for response correctness. Future studies involving stress and verbal learning paradigms need to consider (a) the degree of established habit, (b) the restriction of the range of cues used due to a stressor, and (c) the criterion for correct response in recall.

REFERENCES

1. BERRY, F. M., & BAUMEISTER, A. A. Measuring single-letter cue selection in paired-associate learning: A methodological note. *J. of Psychol.*, 1971, **77**, 181-187.
2. BESCH, M. F. Paired-associate learning as a function of anxiety level and shock. *J. Personal.*, 1959, **27**, 116-124.
3. CHILES, W. D. Effects of shock-induced stress on verbal performance. *J. Exper. Psychol.*, 1958, **56**, 159-165.
4. EASTERBROOK, J. A. The effect of emotion on cue utilization and the organization of behavior. *Psychol. Rev.*, 1959, **66**, 183-201.
5. KAUSLER, D. H., TRAPP, E. P., & BREWER, C. L., Intentional and incidental learning under high and low emotional drive levels. *Psychol. Rep.*, 1962, **10**, 451-457.
6. LEE, C. L. The effects of anxiety level and shock on a paired-associate verbal task. *J. Exper. Psychol.*, 1961, **61**, 213-217.
7. POSTMAN, L., & GREENBLOOM, R. Conditions of cue selection in the acquisition of paired-associate lists. *J. Exper. Psychol.*, 1967, **73**, 91-100.
8. WITMER, L. R. The association value of three-place consonant syllables. *J. Genet. Psychol.*, 1935, **47**, 337-360.

Department of Psychology
Angelo State University
San Angelo, Texas 76901

SUBJECT SENSITIVITY TO COLOR IN ESTIMATION OF DOT FREQUENCY FOR SAMPLES OF COLOR NORMAL AND COLOR DEFECTIVE MALES*

University of Florida

E. P. HORNE AND WAYNE K. LINDER

SUMMARY

Color normal and color defective male subjects were presented randomly either yellow-red, yellow-green, or neutral gray circular dots at seven frequency levels on each block of two homogeneous backgrounds of white or black color. Subjects estimated the number of dots at each of two illumination levels. Dot color and color-frequency interaction failed to reach .05 level for the Brandt-Snedecor chi-square test. For two digit coding, actual dot frequency was significant, and the estimates were linear and approximate over the 16 to 37 range. No significant mean difference was obtained between color normal and color defective subjects.

A. INTRODUCTION

In 1871 W. S. Jevons (10) reported on the relationship between estimated number and real number of exposed black beans on a black background. In the 100 year interval, many studies have dealt with the apprehension of number. Freeman (7) and Fernberger (5) reported on dot estimation. "Enumeration," as reviewed by Beckwith and Restle (2) in 1966, was related to the organization of the visual field. Additional related studies were reviewed in a report of recent research by Horne and Allee (9). In that experiment, accuracy of estimation was related to dot frequency, brightness level of background, and areas of dispersion for each of two colors of dots. Subjects were color normal female students. The present study reports color sensitivity research on some of these variables, using as subjects one group of color normal males and one group of color defective males. Its purpose is to determine whether color information, perceived by subjects of different color sensitivity, will affect accuracy of dot estimation.

The first hypothesis was that color normal Ss would estimate more accu-

* Received in the Editorial Office on October 2, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

rately the number of dots than would color defectives. Since both color and color-number interaction were significant in the previously cited study with color normal females, sensitivity to yellow-red (YR) and yellow-green (YG) color appeared to contribute to their accuracy of estimation.

A second hypothesis was that, at all dot frequency levels, dots of YR or YG would yield better estimates than gray dots for color normals. For the color defective Ss, color of dot should not affect estimates. Furthermore, with gray dots, color normal and color defective subjects' estimates should be of the same order.

Although level of illumination (dependent on ground) had not affected accuracy of estimation in the color normal females, it was predicted that this variable might affect the estimates of the color defectives in the present study; in the absence of color contrast, the contrast reduction was expected to increase errors of estimation for the color defectives.

B. METHOD

Two backgrounds homogeneous in white (Munsell 9.0) or black (Munsell 1.5) were prepared, and on each of these fixed backgrounds dots of one of the three colors, either yellow-red, yellow-green, or neutral gray, were displayed. Dots were of one size and were dispersed over a fixed zone. Random dispersals of dots were prepared for each of seven frequency levels from 16 through 37 as previously described.

The use of the backgrounds provided two illumination levels: one at mesoptic level and the other for daylight level. Each exposure for all 42 cards was one second. Odd-numbered Ss were presented cards 1 to 21 in dark and then cards 22 to 42 in daylight vision. Even-numbered subjects were given the reverse order.

1. Subjects

Twenty-three male volunteers with an average age of 22 years were employed as subjects. Prior to assignment to the present study, the subjects were tested for visual acuity and color vision by an independent investigator. Of the 23 men, 14 were color defective and 9 were color normal. For all subjects, refraction data indicated normality (20/20) or better. Color vision was tested with the Army edition of the A.O.C. Pseudo-Isochromatic Plates (1) and, in some cases, the Farnsworth-Munsell 100 Hue Test for Color Discrimination (3). The distribution of color normal and color defective subjects, as well as the order of assignment, was not known to the experimenter testing dot estimation.

2. Apparatus

The Harvard tachistoscope (Gerbrands) using 4W daylight lamps was used to expose each display card for one second. The black ground gave an illumination of 1 ftL and the white ground a 20 ftL level. Circular dots (.25" diameter) were cut from Hering papers #3 YR, #7 YG, and #19 Gray (approximate 6.2 Munsell) and were spread over an area 7" by 7"; this represents a $17^{\circ} 38'$ zone. Density varied from .33 to .76 dots per square unit.

3. Procedure

The subject's initial task was estimation of the number of dots. Each observer was seated in a semi-darkened room at the tachistoscope and given instructions: "Keep your head in front of the aperture and close to the head rest. Fixate the center of the illuminated area and, on a ready signal, estimate the number of dots on each card immediately after it is exposed. Report your estimate. Do not count dots."

No report was requested of color, dot distribution, or other details. When the subject delayed, further instructions were the following: "The sooner you make your estimate, the more accurate it is likely to be."

The second task, Farnsworth Dichotomous Test for Color Blindness, Panel D-15 (4), followed dot estimation. Also the 1940 A.O.C. Revised Selection of the Pseudo-Isochromatic Plates (1, 8) was given to each observer.

In summary, the adaptation level for illumination was balanced. The order for dot color and for dot frequency was the same for all subjects; for these variables, the card display sequence was randomly determined within one illumination block. On each card all dots were of one color.

C. RESULTS

In Table 1 the mean estimates are indicated by subject groups, background, dot color, and dot frequency.

An analysis of the separate effects was suggested and performed at the University of Florida Computer Center by A. E. Brandt. The Brandt-Snedecor (6) chi square yielded the information which is presented in Table 2. The mean estimates were increasing significantly with the greater number of dots presented to the color defective as well as to the color normal observers under the adaptations for ground and color of dots. The effects due to the variables ground, color, and the several interactions were not significant in either subject classification.

TABLE 1
MEAN ESTIMATES OF THE NUMBER OF DOTS

Subjects	Ground	Dot color	Dot frequency						
			16	19	23	26	29	33	37
Color normal	Black	YR	14.3	17.8	24.3	27.0	33.9	35.6	41.2
		YG	15.2	17.0	22.2	28.2	29.0	34.6	32.3
		Gy	14.9	18.3	24.4	24.6	27.4	35.7	40.1
	White	YR	12.9	16.1	22.3	26.4	32.9	34.7	38.0
		YG	14.9	17.1	22.0	28.1	29.3	30.4	29.6
		Gy	15.1	19.3	23.4	23.1	27.8	37.1	38.7
	Black	YR	14.1	15.6	23.9	27.9	32.1	34.9	40.4
		YG	13.7	16.9	21.3	26.9	30.9	32.9	30.0
		Gy	15.4	17.4	21.3	24.4	28.2	36.4	41.9
Color defective	White	YR	16.1	18.4	24.1	27.9	33.4	34.9	42.1
		YG	14.9	18.3	25.0	28.2	32.3	34.5	30.8
		Gy	16.4	20.4	24.1	28.4	29.0	39.2	42.5

Note: YR = yellow-red; YG = yellow-green; Gy = neutral gray.

With the dot color and background information as indicated, a new summary table of means and standard deviations of estimates for each subject group appears in Table 3. Mean differences and standard errors are shown with the *t* test at each frequency level. Although the mean estimate at each frequency level for the color normals was smaller than the corresponding one for the color defectives, no significant difference was obtained. The ob-

TABLE 2
ANALYSIS OF THE EFFECT OF DOT FREQUENCY, GROUND, AND DOT COLOR FOR
COLOR NORMAL AND COLOR DEFECTIVE SUBJECTS

Subjects	N	Source	Chi square	df	p
Color normal	9	Frequency (Freq)	30.327	6	.001
		Ground (Gr)	1.065	1	.30
		Color (C)	1.342	2	.50
		Freq \times Gr	3.409	6	.80
		Freq \times C	18.486	12	.10
		Gr \times C	3.854	2	.25
		Freq \times Gr \times C	4.639	12	.98
Color defective	14	Frequency (Freq)	12.287	6	.05
		Ground (Gr)	1.367	1	.25
		Color (C)	2.525	2	.30
		Freq \times Gr	2.832	6	.84
		Freq \times C	13.780	12	.30
		Gr \times C	.181	2	.99
		Freq \times Gr \times C	3.820	12	.99

TABLE 3
MEANS AND *SD*s OF ESTIMATIONS FOR EACH DOT FREQUENCY (THREE COLORS AND TWO GROUNDS) FOR COLOR NORMAL AND COLOR DEFECTIVE SUBJECTS AND FOR ALL SUBJECTS

Subjects	<i>N</i>	Dot frequency						
		16	19	23	26	29	33	37
Color normal	9							
Mean		14.6	17.6	23.1	26.2	30.0	34.7	36.7
<i>SD</i>		3.55	4.06	6.05	5.49	6.96	7.17	8.34
Color defective	14							
Mean		15.1	17.8	23.3	27.3	31.0	35.5	37.9
<i>SD</i>		3.78	4.87	6.66	9.09	8.71	11.1	13.3
Mean difference	—	.5	— .2	— .2	— 1.1	— 1.0	— .8	— 1.2
Standard error of mean difference		1.55	1.88	2.69	3.04	3.28	3.81	4.51
<i>t</i>		.32	.11	.07	.36	.30	.21	.27
All subjects	23							
Mean		14.9	17.7	23.2	26.9	30.6	35.2	37.4
<i>SD</i>		3.7	4.6	6.4	7.9	8.1	9.8	11.7

servers' estimates were under the actual number at the low frequencies and over at the higher frequencies. Over the low six levels the estimates were linear. Underestimation was replaced by overestimation near the 23 dot point for the 23 pooled subjects as well as for the separate subject groups.

In Table 4 the effect of subject sensitivity was analyzed by color and ground over the seven frequencies. Color normal subjects were not significantly different from the color defectives, although the mean estimates of the color normals were slightly lower than the same estimates of the color defectives when the illumination was 20 ftL against a white ground.

D. DISCUSSION OF RESULTS

For each of the separate color sensitivity samples of men, the comparison of the estimations for the gray dots and the YR or YG dots indicated that the achromatic estimates for frequencies 33 to 37 and their deviations from the actual number were larger than the estimates of either YR or YG dots; YG dots were generally underestimated, and the YR dots were overestimated. In the estimates over low frequency levels up to 29 dots, color was not significant and the estimates were close to actual dot number, yet color-frequency interaction attained only .10 significance in the samples of color normals and a *p* of .30 for the color defectives.

This study of male subjects was compared with the Horne-Allee (9) study

TABLE 4
EFFECT OF SUBJECT SENSITIVITY BY COLOR AND GROUND

Ground	Dot color	Color normal	Color defective	Diff.	t
Black	YR				
	Mean	27.73	26.97	.76	.16
	SD	10.28	12.76		
	SE			4.83	
	YG				
	Mean	25.50	24.64	.86	.22
	SD	8.91	9.77		
	SE			3.95	
	Gy				
White	Mean	26.49	26.41	.08	.02
	SD	9.98	12.38		
	SE			4.69	
	YR				
	Mean	26.19	28.12	-1.93	.40
	SD	10.53	12.41		
	SE			4.83	
	YG				
	Mean	24.49	26.28	-1.79	.44
	SD	8.67	10.68		
	SE			4.06	
	Gy				
	Mean	26.36	28.56	-2.20	.46
	SD	10.28	12.57		
	SE			4.80	

Note: YR = yellow-red; YG = yellow-green; Gy = neutral gray.

of estimates by female observers. In the latter report, the general underestimations increased with dot number increase in a nonlinear function. The results of the present study showed a linear prediction with a change from small underestimation to a small overestimation. Estimations were not affected significantly by the difference between one and 20 ftL levels of illumination.

A combination of two circumstances may be examined. First, the luminosity difference appears to be not significant for both male and female observers on this task. The second is the hypothesis that the Army Pseudo-Isochromatic plates, the Hardy, Rand, and Rittler AO plates (8), and the 15 D Hue Farnsworth tests would be a basis of prediction of differential perceptual efficiency on dot estimation. The results were generally negative, and a null statement may be accepted at this time.

At present, estimations appear to be primarily a function of the number of dots. Since all displays were using dot frequency in a random order, the

further study of an ascending-descending sequence is in progress for a study of efficiency in estimation.

REFERENCES

1. AMERICAN OPTICAL COMPANY. Pseudo-Isochromatic Plates for Testing Color Perception. Philadelphia & New York: Beck Engraving, 1940.
2. BECKWITH, M., & RESTLE, F. Process of enumeration. *Psychol. Rev.*, 1966, **73**, 437-444.
3. FARNSWORTH, D. The Farnsworth-Munsell 100 hue and dichotomous tests for color vision. *J. Opt. Soc. Amer.*, 1943, **33**, 568.
4. ———. The Farnsworth Dichotomous Test for Color Blindness (Panel D-15). New York: Psychol. Corp., 1947.
5. FERNBERGER, S. W. A preliminary study of the range of visual apprehension. *Amer. J. Psychol.*, 1921, **32**, 121-133.
6. FISHER, R. A. Statistical Methods for Research Workers (6th ed.). Edinburgh: Oliver & Boyd, 1936.
7. FREEMAN, F. N. Grouped objects as a concrete basis for the number idea. *Element. Sch. Teach.*, 1912, **12**, 306-314.
8. HARDY, L. H., RAND, G., & RITTLER, M. C. A screening test for defective red-green vision. *J. Opt. Soc. Amer.*, 1946, **36**, 610-614.
9. HORNE, E. P., & ALLEE, M. Estimation as a function of density and contrast. *J. of Psychol.*, 1971, **78**, 87-94.
10. JEVONS, W. S. The power of numerical discrimination. *Nature*, 1871, **3**, 281-282.

Department of Psychology
University of Florida
Gainesville, Florida 32601

THE EFFECTS OF MODELING AND INSTRUCTIONS ON CREATIVE RESPONSES*

The University of New Mexico

MARY B. HARRIS AND ROBERT C. EVANS

SUMMARY

College students were randomly exposed to a divergent thinking symbolic model, a convergent model, no model, or instructions to respond creatively, and were tested on four tasks of creativity. All tasks showed divergent responses to be more common and convergent responses less common in the following order: divergent model, instructions, no model, and convergent model. However, only four of the 10 dependent measures revealed these differences to be significant, suggesting the necessity for further research.

A. INTRODUCTION

Although there have been a number of recent studies that have attempted to assess the effects of modeling on cognitive behaviors, relatively few have dealt with responses that might be considered creative or unusual. Among those original responses that have been shown to be increased by the presence of a model are language usage (e. g., 6), information-seeking strategies (13, 14), responses to Rorschach cards (12), solutions to Luchins water jar problems (11), and flexibility in solving anagrams (5). Zimmerman and Dialessi (15) found that children's fluent and flexible creative responses were increased by exposure to a fluent creative model and decreased by exposure to a flexible creative model. Harris and Evans (4) demonstrated that exposure to a symbolic model of divergent or convergent responses led to a similar type of responding on an unusual uses task, with some generalization found to dissimilar tasks. The present study attempted to replicate and extend these findings to see to what extent the effect of a model can be expected to generalize across different responses and tasks.

An additional purpose of the present study was to compare the effects of observing a model to those of receiving instructions. Zimmerman and Rosenthal (16) have suggested that on many cognitive tasks the effects of view-

* Received in the Editorial Office on October 4, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

ing a model may be at least as powerful as those of hearing instructions or a rule about appropriate behavior. Since increases in the production of original, novel, or creative responses have been found by researchers who have instructed the *Ss* to respond creatively (1, 2, 8, 9, 10), it seemed worthwhile to see how the effects of such instructions compared to those of observing a creative model.

A previous study by Levy (7), which investigated the extent to which one's defined social role could affect originality, also attempted to compare modeling and instructional influences. However, in his study, all *Ss* were asked to play the role of another person (with information about the other person provided via modeling, reinforcement, or instructions) rather than to respond as they would normally. The present study attempted to assess whether observing a divergent or convergent thinking model which was presented incidentally with no explicit or implicit instructions to imitate would affect *S's* subsequent tendency to give divergent or convergent responses, a procedure that appeared to have greater similarity to situations outside the laboratory, where exposure to other people is rarely followed by explicit demands to imitate.

Ss in the present study were thus exposed to a symbolic model displaying divergent (creative) responses, one displaying convergent (uncreative) responses, instructions to respond creatively, or no model. They were tested on four dependent measures which varied in similarity to the model's task, with the identical task coming last. It was predicted that those exposed to a divergent model and those instructed to respond creatively would be more creative on all tasks than those exposed to no model, who in turn would produce more divergent and fewer convergent responses than *Ss* exposed to a convergent thinking model. It was further predicted that the total number of responses produced by *Ss* in the instructions condition would be smaller than in the other conditions, since Gagné (3) has suggested that such instructions might place a limit on the number of incorrect (uncreative) responses considered acceptable to *S* and thus reduce the number of responses he would produce on a brief timed task.

B. METHOD

1. Subjects

Ss were 79 female and 54 male college students in six classes; their ages ranged from 19 to 54, with a mean age of 25.4 years. The *E* was a male graduate student in education. Within each classroom, *Ss* were randomly

assigned to one of four treatments by receiving randomly arranged mimeographed booklets.

2. Materials

All four booklets consisted of a cover page with an explanation of the study's purpose, a sample answer sheet which contained the manipulation, and four test pages, which were the same for all Ss. All pages contained instructions at the bottom which told the Ss not to turn the page until told to do so. The upper portion of the cover sheet informed the S that the study was being conducted to "gather some much needed normative data on logical thought processes and problem-solving techniques" of students at the university level. It assured the subject's anonymity, stressed the importance of following directions carefully, and stated that there would be four three-minute tasks for him to complete. The instructions continued with the following: "In order to insure that there will be no mistakes, we have inserted a copy of an answer sheet from a similar task [completed by a student in our pilot study]. When you are instructed to do so, please turn the page and study the answer sheet carefully." Ss in both the no model (NM) and instructions (I) conditions had the phrase in brackets omitted from the cover sheet; otherwise it was identical for Ss in all four conditions.

The top of the second page of the booklet contained the sentence: "List as many uses as you can for a paper cup." Ss in the NM group simply saw a page of ruled lines, numbered from 1-30. Ss in the I group saw a similar page with ruled lines numbered from 1-20, but at the bottom in capital letters appeared the instructions: "It has been found that people are often much more creative than they realize. Please answer the entire questionnaire as a very creative and innovative person would." Ss in the convergent model group (CM) saw 20 responses written in, all of which involved using the cup as a receptacle: e. g. "for KoolAid," "to hold bobbypins," "as a planter," etc. Ss in the divergent model group (DM) saw 20 responses of different types: e. g. "use as foundation for bee hive hairdo," "decorate for Christmas bells," "use for building blocks," etc. It was clear to Ss that they were not to write on the sample answer sheet and that their own testing would begin on the next page.

The third page of the booklet, the "what if" test, asked S to list as many changes as he could that would have come about had man evolved to his present level with one additional link to the nonhuman primates: a prehensile tail. The fourth page asked S to list as many uses as he could for a pencil. The fifth page asked S to complete an unfinished story, which dealt with a

business man returning home from a trip to a seemingly empty house with an alien, musty odor. The sixth page was identical to the second page in the NM condition, asking S to list all the possible uses for a paper cup.

3. Procedure

After Ss in each classroom were seated, E handed out the booklets individually and instructed the Ss not to turn their booklets over until told to do so, not to look at anyone else's booklet, and to raise their hands should they have any questions, rather than talking aloud. Ss were then instructed to turn their booklets over, to read the cover page very carefully, and to raise their hands when they had finished. After all Ss had finished the cover page, they were instructed to turn to the second page, study it carefully, and again signal when they were through. For the remaining four pages, Ss were allowed three minutes to complete the task, with a 20-second break between tasks. After completion of the tasks, the booklets were collected individually by E and the purpose of the experiment was explained to the Ss.

4. Scoring

Both the story completion task and the "what if" prehensile tail task had been earlier administered to a pilot group of approximately 60 students, similar to those in the test population, to ascertain the modal responses for each task as a normative sample from which to score the responses from the test population. In the story completion tasks, the modal responses were centered around surprise party, divorce, and disaster themes; hence, the scoring technique used for this task was based on deviations from these responses. Numbers were assigned to all responses from 1-5 with 1 being assigned to responses dealing with the aforementioned categories, 2 being assigned to slight elaborations of the central themes, 3 being assigned to more novel responses with a degree of humor, 4 being assigned to somewhat novel situational responses that in no way alluded to the modal responses, and 5 being assigned to unique responses, responses that appeared only once in the entire study. In the "what if" prehensile tail task, the modal responses dealt with changes in clothing, furniture, and automobiles; hence these responses were scored as convergent, with other responses scored as divergent. In the pencil task, responses indicating use of the pencil as a writing implement were scored as convergent and others as divergent; for the paper cup task, those using the cup as a receptacle were scored as convergent and others as divergent. The numbers of convergent, divergent, and total responses for this task and the two unusual uses ones and the assigned score for the "what if" task comprised the 10 dependent measures. To insure

scorer objectivity, all answer sheets were scored from the last page forward with the first two pages folded away under the booklet. Responses to each task were scored for all Ss before proceeding to the next task.

C. RESULTS

Each protocol was independently scored by two individuals; the correlation between their scores before any discussion or rechecking was .86. In instances of disagreement, a third party, blind to the prior score, rescored the task. A recheck and subsequent discussions of the classification of the particular response served to resolve all problems.

Ten 4×2 unweighted means analyses of variance for treatment and sex were performed on the 10 dependent variables. Significant F values for treatment were found on the measures of divergent responses to the "what if" task ($F = 3.06$, $df = 3/126$, $p < .05$), convergent responses to the pencil task ($F = 3.59$, $df = 3/126$, $p < .05$), convergent responses to the paper cup task ($F = 8.86$, $df = 3/126$, $p < .001$), and divergent responses to the paper cup task ($F = 6.23$, $df = 3/126$, $p < .01$). Females had a significantly higher total number of responses than males on the "what if" task ($F = 5.35$, $df = 3/126$, $p < .01$). Males had a significantly higher score than females on the paper cup divergent task ($F = 4.17$, $df = 3/126$, $p < .05$). There were no sex by treatment interactions found on any measure.

A number of Schaffé *post-hoc* comparisons were done to assess where the treatment differences lay. The results of these comparisons are presented in Table 1.

Ss in the DM group gave significantly more divergent responses in the "what if" and paper cup situations than those in the other three groups. Ss in the CM group gave significantly more convergent responses in the pencil and paper cup situations than those in the other three groups.

The order of the means across all measures was completely consistent. For the number of convergent responses to the "what if," pencil, and paper cup tasks, the order in all three cases was $CM > NM > DM > I$. For the number of divergent responses to the above three tasks and the degree of originality in the story completion task, the order in all four cases was $DM > I > NM > CM$.

D. DISCUSSION

The results of the present study are consistent with earlier research indicating that exposure to a divergent or convergent model can cause the observer to produce similar responses to an identical or similar task. Similarly,

TABLE 1
SCHEFFÉ *Post-Hoc* COMPARISONS FOR TREATMENT EFFECTS

Task	Treatment					
	CM-DM	CM-I	CM-NM	DM-NM	DM-I	NM-I
"What if" divergent	DM > CM $F = 37.50^{****}$	I > CM $F = 7.42^*$	NM > CM $F = 7.16^*$	DM > NM $F = 10.86^{**}$	DM > I $F = 10.85^{**}$	
Pencil convergent	CM > DM $F = 22.44^{****}$	CM > I $F = 31.54^{****}$	CM > NM $F = 19.78^{****}$			
Paper cup convergent	CM > DM $F = 79.49^{****}$	CM > I $F = 75.36^{****}$	CM > NM $F = 26.04^{****}$	NM > DM $F = 12.45^{***}$		NM > I $F = 12.52^{***}$
Paper cup divergent	DM > CM $F = 56.25^{****}$	I > CM $F = 41.49^{****}$	NM > CM $F = 12.13^{***}$	DM > NM $F = 14.62^{***}$	DM > I $F = 8.54^{**}$	I > NM $F = 8.80^{**}$

* $p < .10$.

** $p < .05$.

*** $p < .01$.

**** $p < .001$.

Note: CM = convergent model group; DM = divergent model group; I = instructions group; NM = no model group.

on one task, Ss instructed to respond creatively appeared significantly more original than those viewing no model or a convergent thinking model. Although the results on the less similar tasks were not statistically significant, the completely consistent direction of the means suggests strongly that those exposed to a divergent model or to instructions to imitate produced more divergent and fewer convergent responses than those exposed to no model, who in turn produced more divergent and fewer convergent responses than those exposed to a convergent thinking model. More research on other tasks and on different techniques of model presentation and instructions is necessary, however, to discover to what extent generalization across tasks is possible.

The question of whether modeling or instructional effects are more powerful determinants of creative behavior appears to be answered in favor of modeling, at least under the conditions of the present study. In all four measures of creativity, Ss in the divergent model group were more original than those merely instructed to be creative, significantly so in two. One reason for this may be that exposure to a model produced more explicit information about the type of responses considered as creative than did general instructions to act in a particular way; however, it would be more difficult to use this as an explanation of the significant differences in the "what if" task, since the model's responses to the paper cup unusual uses task were quite different from those expected of the S.

The prediction that Ss in the instructions condition would give significantly fewer total responses was not upheld, although they did give the smallest number of convergent responses in three tasks for which these were scored and the smallest total number for two of the three and second smallest for the third (all nonsignificant, however). It is possible that on a different task, particularly one with more time, such results would have appeared. In general, then, the results of the present study had best be considered suggestive, rather than conclusive, with strong implications that Ss may show increases or decreases in their original responses after seeing a model and that the effects of viewing a model are stronger than instructions to respond creatively.

REFERENCES

1. CHRISTENSEN, P. R., GUILFORD, J. P., & WILSON, R. C. Relation of creative responses to working time and instructions. *J. Exper. Psychol.*, 1957, **53**, 82-88.
2. COLGROVE, M. A. Stimulating creative problem solving: Innovative set. *Psychol. Rep.*, 1968, **22**, 1205-1211.
3. GAGNÉ, R. M. The acquisition of knowledge. *Psychol. Rev.*, 1962, **69**, 355-365.

4. HARRIS, M. B., & EVANS, R. C. Models and creativity. *Psychol. Rep.*, 1973, **33**, 763-769.
5. HARRIS, M. B., & FISHER, J. L. Modeling and flexibility in problem-solving. *Psychol. Rep.*, 1973, **33**, 19-23.
6. HARRIS, M. B., & HASSEMER, W. G. Some factors affecting the complexity of children's sentences: The effects of modeling, age, sex, and bilingualism. *J. Exper. Child Psychol.*, 1972, **13**, 447-455.
7. LEVY, L. H. Originality as role-defined behavior. *J. Personal. & Soc. Psychol.*, 1968, **9**, 72-78.
8. MALTZMAN, T., BOGARTZ, W., & BREGER, L. A procedure for increasing word association, originality and transfer effects. *J. Exper. Psychol.*, 1958, **56**, 392-398.
9. MALTZMAN, T., BROOKS, L. D., BOGARTZ, W., & SUMMERS, S. S. The facilitation of problem solving by prior exposure to uncommon responses. *J. Exper. Psychol.*, 1958, **56**, 399-406.
10. RIDLEY, D., & BIRNEY, R. Effects of training procedures on creativity test scores. *J. Educ. Psychol.*, 1967, **58**, 158-164.
11. ROSENBAUM, M. E., & ARENSEN, S. J. Einstellung by observation. *Psychol. Rep.*, 1967, **21**, 345-352.
12. ROSENTHAL, T. L., & HERTZ, L. Effects of minimal models on inkblot percepts. *Austral. J. Psychol.*, in press.
13. ROSENTHAL, T. L., & ZIMMERMAN, B. J. Instructional specificity and outcome expectation in observationally induced question formation. *J. Educ. Psychol.*, 1972, **63**, 500-504.
14. ROSENTHAL, T. L., ZIMMERMAN, B. J., & DURNING, K. Observationally induced changes in children's interrogative classes. *J. Personal. & Soc. Psychol.*, 1970, **16**, 681-688.
15. ZIMMERMAN, B. J., & DIALESSI, T. Modeling influences on children's creative behavior. *J. Educ. Psychol.*, in press.
16. ZIMMERMAN, B. J., & ROSENTHAL, T. L. Concept attainment, transfer and retention through observation and rule-provision. *J. Exper. Child Psychol.*, 1972, **14**, 139-150.

Department of Educational Foundations
The University of New Mexico
Albuquerque, New Mexico 87131

PICTURE RECOGNITION BY PRESCHOOL CHILDREN*¹

Columbus College

FRANKLIN M. BERRY, RONALD JUDAH, AND EDWARD M. DUNCAN

SUMMARY

Seventy-one Peabody Picture Vocabulary Test pictures were scaled for consistency of recognition among three-, four-, and five-year-old, middle-class, Caucasian preschool children. The variables of age and sex proved to be significant predictors of the number of pictures recognized correctly by each child. In a further attempt to obtain useful picture recognition norms for this sample of children, recognition scores were examined as a function of age and sex for only highly recognizable pictures (i. e., pictures recognized at least 78 percent of the time by the entire sample). With this sample of pictures the Age \times Sex interaction proved to be significant. As the three-year-old males were the source of the interaction, they were eliminated from consideration in the computation of picture recognition values. This procedure resulted in recognition scale values being calculated for 43 pictures found to be recognized and labeled in a consistent manner by three-year-old females and four- and five-year-old males and females. For this sample of pictures, at least 80 percent of the preschoolers gave the *same* one-word label.

A. INTRODUCTION

In a recent review of verbal learning research in the child population, Reese and Lipsitt (4, p. 199) mentioned that there has been no normative work on the scaling of pictures commonly used as stimulus materials in research with preschool children. This means, of course, that an investigator who wishes to study verbal-learning type phenomena with very young children must either resort to aural presentation of the stimulus materials (e. g., 5) or to pilot work with pictures to determine their suitability for subsequent research (e. g., 1, 3). Since most of the verbal-learning work with older chil-

* Received in the Editorial Office on October 4, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to thank the children and staff of the Columbus (Georgia) Kindergarten Nurseries for their help and cooperation in the execution of this project.

dren and adults has been accomplished in a visual-learning situation, switching to an aural presentation approach with preschoolers is likely to yield research findings for preschoolers that are *not* strictly comparable to those based on older subjects. It would seem that the visual-presentation (picture) approach is a more desirable research strategem. However, as the pilot-study approach to presenting pictorial stimuli involves needless duplication of effort by different researchers, it too appears to be an inefficient approach to verbal-learning research with preschoolers. It seemed to us that what was needed was a set of picture recognition norms for preschool children.

The need for a scale of picture recognizability also became apparent from an examination of some of the procedures that investigators are currently using in presenting picture stimulus materials to preschoolers in verbal-learning experiments. For example, some investigators employ a large "pool" of pictures and use only those pictures that a given *S* can recognize (e. g., 2); hence, different pictures are used with different *Ss*, and this confounding could lead to interpretive problems. In contrast, other investigators provide the names of those pictures that their *Ss* fail to label appropriately and then proceed as if all of the pictures were equally recognizable to *all* of their *Ss* (e. g., 3); this procedure may also result in different pictures being used with different *Ss*, since labels for the different pictures may not be equally available across *Ss*.

It seemed to us that a preferred research strategy would be to select only those pictures that have a high probability of being recognized *and* labeled consistently in the preschool population, and then to eliminate children who failed to recognize the picture stimuli employed in a particular experiment. In this way, *Ss* in the same treatment condition would be presented exactly the *same task*, and *S* loss due to unfamiliarity with the stimulus materials would be minimized. The purpose of the present effort was to establish a scale of recognition consistency for a sample of readily accessible pictures (Peabody Picture Vocabulary Test pictures).

B. METHOD

1. Subjects

The *Ss* were 44 Caucasian children aged either three, four, five, or seven years. The group of seven-year-olds ($N = 6$) was included only for derivation of a sizeable "pool" of picture stimuli that would be suitable for scaling in the preschool population. Three categories of preschoolers (aged three, four, or five) were included to increase the generality of the present normative effort with respect to "cognitive level." That is, since the distribution of

IQ in a population of normal children should have a mean of 100, *CA* was assumed, on the average, to represent the *MA* of each preschool child. Of the 38 preschoolers, two were excluded because they refused to verbalize during the recognition test. The remaining 36 Ss constituted the preschool sample. This sample consisted of 12 three-year-olds, 12 four-year-olds, and 12 five-year-olds with sex balanced at each age category ($N =$ six males and six females in each age group). The mean *CA* for three-year-olds was 3.5 years with an *SD* of .2 years; the mean *CA* for four-year-olds was 4.6 years with an *SD* of .3 years; the mean *CA* for five-year-olds was 5.5 years with an *SD* of .3 years.

All of the children included in the present investigation attended Kindergarten Nursery Schools, at a tuition cost of \$1,040.00 per year. This fact alone led to the conclusion that the present study included only middle-class children; however, other characteristics of the families of these children also suggested that they were middle-class children: (a) two-thirds of the preschool-aged children were members of families in which both parents were employed and (b) 50 percent of the children were from "white-collar" families (e. g., school teachers, bank clerks, civil service, etc.), 22 percent from blue-collar families (e. g., truck drivers, bakery employee, etc.), and 28 percent from military families.

2. Stimulus Materials

As an initial step in deriving a sample of picture stimuli suitable for scaling in the preschool population, a pool of 212 pictures was obtained from the plates of the Peabody Picture Vocabulary Test (PPVT). Pictures from the PPVT were selected for two reasons: first, such pictures do not contain colors, and second, these pictures seem likely to be available to most researchers. The sample included the example plates A, B, and C in addition to the first 50 plates of the actual test. The *Es* previewed these pictures and selected 121 pictures as "suitable" according to the following criteria: (a) each picture had to be described by a single word (by this criterion pictures that showed action, or that presented the child with a concatenation of different stimuli, were eliminated; for example, a picture of a girl knocking on a door and a picture of various vegetables were not acceptable because of this criterion) and (b) duplicate pictures were not permitted. As a second step, the 121 pictures that comprised the initial pool of pictures describable by single words were tested for their recognizability among seven-year-old children ($N = 3$ males, $N = 3$ females). The rationale here was to eliminate those pictures that were not highly identifiable to a sample of older

children. All pictures were mounted on $4'' \times 6''$ cards for presentation to the seven-year-old Ss; a single random order was used to present these pictures. Of the 121 pictures presented, 54 were labeled consistently 100 percent of the time. In addition 17 other pictures produced an identical one-word response by five of the six seven-year-olds. The 71 high-recognizability pictures were selected for further scaling efforts.

3. Procedure

The 36 preschool Ss were tested at either of two Kindercare Nursery locations. Since both locations had identical floor plans, comparable rooms were used to test Ss at both locations. For the recognition test, three random orders of the 71 test pictures were used equally often as "test" series. Each S was seated at a table to the left of and facing E and instructed as follows: "I am going to show you some pictures, please tell me the names of as many pictures as you can." E manually presented each picture stimulus to each child; he also manually recorded each S's label for each picture. Each S was provided 10 seconds to label each picture; if an S did not respond to a particular picture within 10 seconds, the E presented the next picture, and so on. This procedure was repeated until all 71 pictures had been tested for each S.

C. RESULTS

The dependent variable for the first analysis of the picture recognition data was the number of pictures recognized and labeled appropriately by each child. Only the *most frequently occurring* (appropriate) label was scored as correct; "good" synonyms were counted as errors. (This procedure was employed because the main purpose of the study was to generate a pool of picture stimuli which could be expected to function analogously to the words used in verbal-learning studies with adults.) The means and SDs of the number of pictures correctly recognized by each subgroup of preschoolers are presented in the top portion of Table 1. When it is recalled that each child was exposed to 71 PPVT pictures, it becomes clear that these preschool children did not have labels available for a number of the pictures. Further, an examination of the top portion of Table 1 shows that the female preschool children tended to be able to recognize consistently more pictures than the male preschool children and, also, that the older preschool children tended to be able to recognize consistently more pictures than the younger preschool children.

A 2×3 (Sex \times Age) analysis for two between-Ss variables revealed

TABLE 1
MEANS AND SDs OF TOTAL NUMBER OF PICTURES RECOGNIZED BY
THE THREE-, FOUR-, AND FIVE-YEAR-OLD Ss

Ss	Age (years)		
	Three	Four	Five
<i>Based on 71 PPVT pictures</i>			
Males			
Mean	37.8	49.5	57.1
SD	8.4	9.6	5.8
Females			
Mean	46.9	55.6	58.3
SD	8.6	4.8	4.1
<i>Based on 41 PPVT pictures</i>			
Males			
Mean	30.3	37.5	39.3
SD	4.3	3.3	1.5
Females			
Mean	36.8	38.8	39.0
SD	4.7	1.9	1.7

that only these visible trends were significant: for the Sex main effect, $F(1, 30) = 5.2$, and for the Age main effect, $F(2, 30) = 14.3$, both $ps < .01$. Further analysis of the Age effect showed that the five-year-olds and the four-year-olds both tended to recognize more pictures than the three-year-olds, respective $ts(30) = 5.3$ and 3.5 , both $ps < .01$, and also that the former two did not differ significantly from each other, $t(30) = 1.8$, $p < .10$. As it was apparent that the recognition data based on all 71 PPVT pictures could hardly be useful in a normative sense because of the significant Sex and Age effects, a second strategy was implemented; viz., only those pictures with a high probability of being recognized (at least 78 per cent of the time) were retained in the sample for further attempts at generating picture recognition norms.

The bottom portion of Table 1 presents the means and SDs of the number of pictures recognized correctly when only 41 highly recognizable pictures are considered. Inspection of these values suggests that the three-year-old males tended to recognize fewer pictures than did any of the remaining five subgroups and also that the other five subgroups all performed comparably. The results of a second 2×3 (Sex \times Age) analysis of variance based on these scores produced the following significant effects: (a) Age, $F(2, 30) = 10.6$, $p < .01$; (b) Sex, $F(1, 30) = 5.6$, $p < .025$; and (c) interaction, $F(2, 30) = 3.8$, $p < .01$. An analysis of simple effects showed that the

source of the interaction was indeed the group of three-year-old males; i. e., the only age differences involved comparisons between the three- and four-year-old males and the three- and five-year-old males, $t_s(15) = 3.8$ and 4.8 , respectively, both $p_s < .01$. Similarly, the only significant sex difference occurred at the three-year-old level, $t(10) = 3.6$, $p < .01$. The results of this second analysis suggest that, when only highly recognizable pictures are considered, three-year-old-females and four- and five-year-old males and females can be expected to perform comparably in terms of recognizing and labeling this sample of pictures.

Table 2 presents 43 highly recognizable PPVT pictures in decreasing probability of recognition; each scale value is based on the performance of all of the preschoolers sampled ($N = 30$) exclusive of the three-year-old males. (To the 41 highly recognizable PPVT pictures, two more were added

TABLE 2
PROPORTIONS OF Ss ($N = 30$) CORRECTLY RECOGNIZING EACH PICTURE (WHERE RECOGNITION REFERRED TO PRODUCTION OF THE SINGLE MOST COMMON ONE-WORD LABEL) FOR 43 PPVT PICTURES PRESENTED TO PRESCHOOL CHILDREN AGED THREE, FOUR, OR FIVE YEARS^a

Item	PPVT plate	p	\sqrt{pq}	Item	PPVT plate	p	\sqrt{pq}
Apple	"C"	1.00	0	Bell	9	.93	.26
Knife	2	1.00	0	Broom	4	.93	.26
Clown	7	1.00	0	Bus	2	.93	.26
Spoon	"A"	1.00	0	Wagon	3	.90	.30
Hand	6	1.00	0	Dog	4	.90	.30
Flag	7	1.00	0	Cow	2	.90	.30
Butterfly	"C"	1.00	0	Snake	21	.90	.30
Drum	16	1.00	0	Baby	3	.90	.30
Fish	"B"	1.00	0	Bear	10	.90	.30
Present	19	1.00	0	Shovel	35	.90	.30
Car	1	1.00	0	Pencil	"C"	.90	.30
Turtle	10	.97	.17	Brush	1	.87	.34
Chair	"B"	.97	.17	Umbrella	9	.87	.34
Ball	5	.97	.17	Ring	16	.87	.34
Duck	6	.97	.17	Sock	"C"	.87	.34
Truck	4	.97	.17	Squirrel	10	.87	.34
Gun	6	.97	.17	Pin	5	.83	.37
Banana	"B"	.97	.17	Spider	43	.80	.40
Leaf	17	.97	.17	Belt	14	.80	.40
Blocks	6	.93	.26	Kite ^b	28	.80	.40
Hot-dog	25	.93	.26	Wagon ^b	16	.80	.40
Table	1	.93	.26				

^a Each recognition value is based on $N = 30$: six three-year-old females, 12 four-year-old males and females, and 12 five-year-old males and females. It is important to note that these values are *not* applicable to three-year-old males, who are less likely to label a number of these pictures appropriately.

^b These pictures met the 78 percent recognition criterion only after the three-year-old males were excluded from the preschool sample.

as a result of the exclusion of the three-year-old males. The two additional pictures meeting the 78% recognition criterion were Kite and Wagon.) A careful inspection of Table 2 will reveal that some 33 pictures were recognized and given the *same* label by at least 90 percent of the 30 preschool children; this value represents the sum of the 1.00, the .97, the .93, and the .90 recognition-value pictures. These 33 pictures are probably the most useful in a normative sense; however, even the remaining 10 pictures can be expected to be recognized 80 percent of the time in a comparable sample of middle-class preschool children. It should be apparent that the potential usefulness of each picture as a stimulus item in a verbal-learning experiment can be gauged by examination of its scale value *and* its standard deviation.

D. DISCUSSION

The present results suggest that the selection of picture stimuli for verbal-learning investigations with preschoolers requires that attention be paid to at least two different subject characteristics—age and sex. Four- and five-year-old preschoolers tend to have larger repertoires of pictures that they can recognize and label consistently than do three-year-old preschoolers. Female preschoolers likewise tend to have larger repertoires than male preschoolers; this effect is also most pronounced at the three-year-old level. What this suggests, of course, is that any large-scale attempt to establish norms of stimulus characteristics for preschool children, such as picture recognizability, must include age and sex as variables.

The picture recognition norms for the 43 highly recognizable pictures (80-100 percent recognizable) should prove useful to investigators who are interested in conducting verbal-learning research using the visual modality for presentation of the stimulus materials. As was indicated earlier, the availability of picture-recognition norms makes it possible to preselect stimuli such that the *same* stimuli can be presented to all Ss, rather than employ different stimuli with different Ss. This should not be taken to mean that all pictures that an S can correctly recognize and label are equally available to him; rather, it seems more likely that some pictures would be recognized and labeled with ease, whereas others would be recognized and labeled only with difficulty, possibly only with considerable difficulty. The important point to remember, however, is that this situation *also* exists for word stimuli and probably with any other set of stimuli as well.

It should be recalled that the purpose of this research was to generate "word-equivalents" for use in verbal-learning research with illiterate preschool children. In this regard the present study has turned out to be only

partially successful. From an initial sample of 71 pictures, useful normative data have been obtained for only 43 pictures, and three-year-old males ended up being excluded from consideration. It should be evident also that the present recognition scale values are only temporary and partial solutions to the very serious problems of conducting verbal-learning research with preschool children with use of pictures as stimulus materials. What is really needed is a large-scale normative effort based on hundreds of Ss and hundreds of pictures.

REFERENCES

1. BERRY, F. M., & JONES, Q. R. Stimulus encoding in paired-associate learning by illiterate children: A methodological demonstration of a picture-redundancy paradigm. *J. Gen. Psychol.*, 1973, **88**, 55-63.
2. MCCARVER, R. B., & ELLIS, N. R. Effect of overt verbal labeling on short term memory in culturally deprived and nondeprived children. *Devel. Psychol.*, 1972, **6**, 38-41.
3. MOELY, B. E., & SHAPIRO, S. L. Free recall and clustering at four age levels: Effects of learning to learn and presentation method. *Devel. Psychol.*, 1971, **4**, 490.
4. REESE, H. W., & LIPSITT, L. *Experimental Child Psychology*. New York: Academic Press, 1970.
5. SHAPIRO, S. S., & PALERMO, D. S. Mediation in children's aural paired-associate learning. *Child Devel.*, 1968, **39**, 569-577.

Psychology Department
Columbus College
Columbus, Georgia 31907

VERBAL DISCRIMINATION TASK PERFORMANCE AS A
FUNCTION OF SELF *VERSUS* EXTERNAL REINFORCEMENT,
I-E SCALE PERFORMANCE, AND SUBJECT *VERSUS*
EXPERIMENTER DETERMINATION OF RESPONSE*

Arizona State University and Phoenix Veterans Administration Hospital

JOHN J. UNMACHT¹ AND FREDERICK W. OBITZ

SUMMARY

One hundred forty-four subjects dichotomized as internal or external on the I-E scale were randomly assigned to one of three reinforcement conditions—no reinforcement, self-reinforcement, or external reinforcement—and one of three subject determination of the correct response conditions—0%, 50%, or 100%. Trials to criterion and errors to criterion on a complex verbal discrimination task were the dependent variables. The results demonstrated that self-reinforcement influenced learning to a greater degree than no reinforcement. Further, when subjects were allowed to determine 100% of the correct responses, the effects of self-reinforcement paralleled the effects of external reinforcement. When subjects determined 50% or 0% of the correct responses, the self-reinforcement and no reinforcement conditions did not differ in influencing overall rate of learning. Internals made significantly fewer errors than externals.

A. INTRODUCTION

Skinner (27) defined self-reinforcement as the event of a subject administering a stimulus to himself that is a reinforcer when externally administered. Research has only recently begun to appear in this area (e. g., 2, 12, 17) with the majority of investigations limiting their concern to the modification of self-reward patterns (3, 4, 5, 6, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25). Several studies attempted to relate, although indirectly, self-reinforcement to number of correct responses in a learning situation. These studies demonstrated that when the subject was allowed to reinforce himself, he could maintain correct responding in the absence of external rein-

* Received in the Editorial Office on October 5, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Now at Scottsdale Guidance Center, 7300 4th Street, Scottsdale, Arizona 85281. Requests for reprints should be sent to this address.

forcement; however, self-reinforcement did not increase response strength over a baseline pre-established by external reinforcement. The reinforcing properties of self-reinforcement were not, therefore, directly demonstrated.

Directly related to the self-reinforcement concept is the internal-external (I-E) control of reinforcement construct (24). Several studies have indicated that a relationship among the internal-external control dimension, learning, and performance does exist (7, 9, 23, 26). In general, these studies have suggested that subjects who tend to view a situation as under their own control or influenced by their own behavior demonstrate better performance in complex learning situations.

The internal-external control dimension is related to subject *versus* experimenter determination of the correct response in a learning situation. Essentially, this variable deals with the effects of subject *versus* experimenter control of an experimental situation. A study by Cromwell *et al.* (8) explored this variable and produced the finding that normal subjects, given some control over the experimental situation, performed better on a reaction time task than subjects who were given no control over the experimental situation. A study by Eberly (10) supported the hypothesis that subjects who have some control over a situation perform better than subjects who are in a situation controlled by the experimenter.

The present study investigated the main and interactional effects of self *versus* external reinforcement, I-E scale performance, and subject *versus* experimenter determination of response on a complex verbal discrimination task.

B. METHOD

In this experiment, the independent variables were arranged in a $3 \times 2 \times 3$ analysis of variance design. The levels of the first three-level factor consisted of type of reinforcement: self-reinforcement, external reinforcement, and no reinforcement. The levels of the two-level factor consisted of I-E scale categorization: internal or external. The levels of the second three-level factor consisted of subject determination of response: 0%, 50%, and 100% subject determination. There were eight subjects in each of 18 experimental conditions. Two dependent variables were measured from the learning task: trials to criterion and errors to criterion.

1. Materials and Apparatus

The stimuli consisted of one list of 12 triads, each triad consisting of three different low meaningful CVC trigrams (1). The list of 12 triads was

arranged in six different random orders with the restriction that a given triad occurred only once within each of the six orders, and the same triad could not appear twice in succession. The position of a trigram within a triad changed from one presentation of a triad to another. The stimuli were flashed on a wall directly in front of the subject by means of a Kodak Carousel Projector. A self-paced responding technique was used.

A $6 \times 5 \times 3$ inch wooden box with an opaque face concealing the word "good" was positioned in front of the subject on a table. Either the experimenter or the subject was able to use a microswitch to activate the sign so that the word "good" appeared on the opaque face in green letters. The sign provided the reinforcing stimulus when lighted.

2. Procedure

One hundred forty-four introductory psychology students at Arizona State University were administered the I-E scale and were subsequently divided into internals and externals depending on their score on the scale. Subjects whose score was 14 and above were placed into the external group; subjects whose score was 7 or lower were placed into the internal group. Subjects in the external and internal groups were then randomly assigned to one of the three subject determination conditions and one of the three reinforcement conditions.

Each subject was tested individually. He was seated in front of the table which had the reinforcement box placed in the middle of it. The experimenter was seated to one side of the subject. Subjects receiving self-reinforcement and external reinforcement were given the instructions which follow. Subjects in the no reinforcement condition were given the same instructions with the passage concerning reinforcement deleted. A copy of the instructions was handed to the subject to read while the experimenter read the instructions aloud. The instructions were as follows:

This is a learning experiment. Today you will learn a list of syllables. I will show you a list of 12 sets of syllables, one set at a time. Each set contains three syllables and will be projected on the wall with this projector. During the time that the three syllables are present, you must choose one of them as the correct answer and spell it out loud. There will be two phases to this experiment. First you will have a training trial where there will be one presentation of the list of 12 sets of syllables. After you spell out one of the syllables, I will say, "The correct syllable is . . ." and then I will read the correct syllable. After you have chosen a syllable and I have given you the correct syllable, I will show you the next set of syllables. After one training trial you will be given 10 test trials. You will do exactly as you did during

the training trial, only in the test trials I will *not* read to you the correct syllable. After you spell out one of the syllables, a light signalling "good" in the box in front of you will light up if your answer is correct. Following the 10 test trials, you will receive another training trial. The experiment will be finished when you complete two consecutive trials of the list correctly.

Subjects receiving self-reinforcement were given the following additional instructions:

Each time following the syllable which you spelled aloud, if you think you picked the correct syllable I want you to press this button once, causing the "good" sign to come on.

Subjects receiving external reinforcement were given the following additional instructions:

Each time following the syllable which you spelled aloud, if you picked the correct syllable I will press this button once, causing the "good" sign to come on.

Subjects in the no reinforcement condition received no instructions concerning the box or the button. The button was deactivated during this condition.

Forty-four trials were divided into four blocks of one training trial followed by 10 test trials. The first order of 12 triads was presented as the first training trial. Following each syllable spelled aloud by the subject during the training trial, the experimenter said, "The correct syllable is. . ." and gave the correct syllable. In the case of 100% subject determination of the correct response, the experimenter merely gave as the correct syllable the syllable read aloud by the subject. This occurred for all sets of syllables on the first trial of the list only. During 0% subject determination of the correct response, the experimenter said, "The correct syllable is. . ." and read a randomly chosen syllable different from the one the subject read aloud. For 50% subject determination the experimenter randomly assigned six syllables as correct as he did in the 0% condition, and the subject designated six syllables as correct in the same way as in the 100% condition. Once the correct syllables had been chosen on the first trial, they remained correct throughout the rest of the presentations of the syllable sets.

A trial consisted of the presentation of one order of 12 triads. There was no break between the end of one order and the beginning of the next. The experiment was completed either when the subject reached criterion, which was two consecutive errorless trials, or when he had completed 40 test trials.

C. RESULTS

The means and standard deviations for the number of trials to criterion and errors to criterion for all experimental conditions are shown in Table 1.

The trials to criterion data were analyzed in a completely randomized $3 \times 2 \times 3$ analysis of variance. This analysis indicated that type of reinforcement had a statistically significant effect on performance ($F = 29.76$, $p < .001$). Newman-Keuls comparisons between group means revealed the external reinforcement group took significantly fewer trials to reach criterion than either the self-reinforcement group ($q = 11.78$, $p < .01$) or the no reinforcement group ($q = 13.36$, $p < .01$). The self-reinforcement and no reinforcement groups did not differ significantly in number of trials to criterion.

Level of subject determination of response had a statistically significant effect on performance ($F = 5.62$, $p < .005$). Newman-Keuls comparisons revealed the 100% determination group took significantly fewer trials to reach criterion than the 0% determination group ($q = 13.36$, $p < .01$) or

TABLE 1
MEANS AND SDs FOR THE NUMBER OF TRIALS AND ERRORS TO CRITERION

Reinforcement/I-E	0%		Subject determination 50%		100%	
	Mean	SD	Mean	SD	Mean	SD
<i>Trials</i>						
No reinforcement						
Internals	26.88	12.02	29.38	9.46	18.88	8.98
Externals	29.25	12.31	29.13	8.10	32.75	8.48
External reinforcement						
Internals	16.38	6.72	14.25	3.73	13.63	9.56
Externals	18.00	7.05	17.00	7.64	12.25	4.92
Self-reinforcement						
Internals	28.88	8.90	31.38	8.16	19.00	11.30
Externals	31.75	8.38	30.25	8.40	22.75	12.56
<i>Errors</i>						
No reinforcement						
Internals	101.50	57.20	101.00	47.64	48.63	26.40
Externals	131.13	67.90	120.63	48.17	105.75	51.29
External reinforcement						
Internals	60.00	19.71	43.13	16.10	40.50	37.46
Externals	67.87	31.94	56.50	29.38	34.75	22.75
Self-reinforcement						
Internals	105.00	48.76	121.75	56.58	43.38	33.92
Externals	130.63	53.55	102.75	26.82	59.75	52.82

the 50% determination group ($q = 11.77, p < .01$). The 0% and 50% groups did not differ from each other. No other significant main effects or interactions were found.

The number of errors to criterion data were Vincentized (11, 28) to explore fully the differential rate of learning under the experimental conditions. The Vincent procedure determines the total number of errors for successive tenths of trials to criterion. The Vincentized data were then subjected to a $3 \times 2 \times 3 \times 10$ repeated measures analysis of variance, with the additional 10 level repeated measures factor representing trial blocks.

The analysis of variance of the Vincentized data indicated that type of reinforcement had a significant effect on performance ($F = 18.72, p < .001$). Newman-Keuls comparisons revealed the no reinforcement group made more errors than the external reinforcement group ($q = 20.75, p < .01$). The self-reinforcement group made more errors than the external reinforcement group ($q = 18.28, p < .01$).

The analysis of the Vincentized data also revealed that level of subject determination had a statistically significant effect on performance ($F = 12.94, p < .001$). Newman-Keuls comparisons indicated the group determining 0% of the correct responses made more errors than either the 50% group ($q = 20.75, p < .01$) or the 100% group ($q = 20.75, p < .01$). The group determining 50% of the correct responses made more errors than the 100% group ($q = 18.28, p < .01$).

The analysis further indicated that I-E scale differentiation had a significant effect on performance ($F = 4.19, p < .05$). Externals made more errors than internals.

Finally, the analysis of the Vincentized data revealed significant interactions of trial blocks by type of reinforcement ($F = 4.55, p < .001$), trial blocks by subject determination ($F = 10.61, p < .001$), and a significant triple interaction of trial blocks by type of reinforcement by subject determination ($F = 2.15, p < .001$). Further analyses, therefore, were restricted to the three-factor interaction. To explicate the nature of this interaction, the means for all reinforcement conditions at each of the 10 trial blocks for 0% subject determination, 50% subject determination, and 100% subject determination were subjected to Newman-Keuls analyses. Newman-Keuls comparisons revealed that self-reinforcement and external reinforcement groups did not differ significantly from each other in blocks 1, 3, 4, 5, 6, and 9 under 100% subject determination. In blocks 2, 7, 8, and 10 the external reinforcement group made fewer errors than the self-reinforcement

group under 100% subject determination. The no reinforcement group receiving 100% subject determination made significantly more errors than the self-reinforcement group on blocks 1, 2, 3, and 4. The no reinforcement group made significantly more errors than the external reinforcement group over all trial blocks.

The trial blocks by type of reinforcement by subject determination interaction was examined further to help clarify the meaning of this effect. In the self-reinforcement condition Newman-Keuls comparisons indicated that the 0% and 50% subject determination groups did not differ significantly from each other, but both differed significantly from the 100% group in blocks 1-6. By block 10 the three subject determination groups did not differ significantly from one another in number of errors. For the external reinforcement condition, Newman-Keuls comparisons indicated that the 0% subject determination group made more errors than the 50% and 100% groups in blocks 1-3, but only made significantly more errors than the 100% group in later trial blocks (blocks 4, 6, 7, 8). By blocks 9 and 10 the three groups did not differ significantly. The 50% and 100% subject determination groups only differed significantly on two trial blocks. For the no reinforcement condition results were similar to those reported for the self-reinforcement group.

D. DISCUSSION

A prime objective of this investigation was to establish the effects of self-reinforcement on the learning of a complex task and to compare the effects of self-reinforcement, external reinforcement, and no reinforcement. The analysis of the Vincentized errors data revealed that self-reinforcement lay between no reinforcement and external reinforcement in its effects on the rate of learning. The results demonstrated that self-reinforcement was able to affect learning to a greater degree than was no reinforcement. Further support for the reinforcing effects of self-reinforcement came from the finding that subjects who were allowed to determine all of the correct responses and who were also given control over the reinforcement did not, with the exception of the final trial blocks, differ significantly from those subjects who also determined all of the correct responses but who received reinforcement controlled by the experimenter. Thus, under these conditions, self-reinforcement was as effective as external reinforcement in influencing overall rate of learning. The group that received no reinforcement plus 100% subject determination was, with the exception of the final trial blocks, significantly poorer in overall rate of learning than the corresponding self-

reinforcement group. These data suggest that the reinforcing effects of self-reinforcement under this condition paralleled those of external reinforcement.

Although self-reinforcement paralleled external reinforcement in the 100% subject determination condition, it paralleled no reinforcement in the 0% and 50% conditions. The data indicated that self-reinforcement and no reinforcement were generally not significantly different from each other, whereas both were significantly poorer than external reinforcement in overall rate of learning in the 0% and 50% subject determination conditions. It is not clear as to why self-reinforcement was not effective under these conditions. One possible explanation would be that self-reinforcement loses its effectiveness when control over the determination of the correct response is diminished. A second interpretation might be that when subjects determine 100% of the correct responses, the task becomes easier.

In contrast to the results derived from the analysis of the Vincentized errors, the results from the analyses of the trials to criterion measure indicated that self-reinforcement did not significantly differ from no reinforcement, both conditions being significantly inferior to external reinforcement in overall rate of learning.

This investigation also had as its goal the exploration of the consequences of subject determination of the response. Results indicated that subjects allowed to determine 0% of the correct responses made more errors than subjects who determined 50%, and the 50% group made more errors than the subjects who determined 100%. Findings from the trials measure revealed that the 0% and 50% conditions did not differ significantly, but both took significantly more trials than the 100% condition. Both response measures lend support to the conclusion that as the subject is allowed to determine more of the correct responses, and thereby exert more control, he will perform better.

A final objective was to explore the relationship between the internal-external control of reinforcement dimension and performance. The data indicated internals made significantly fewer errors than externals. The analysis of the trials to criterion measure indicated that internals and externals did not differ significantly. This may demonstrate that internals are more efficient learners than externals in that they make fewer errors, but they do not differ from each other in overall rate of learning.

REFERENCES

1. ARCHER, E. Reevaluation of the meaningfulness of all possible CVC trigrams. *Psychol. Monog.*, 1960, **74** (10), Whole No. 497.

2. BANDURA, A. *Principles of Behavior Modification*. New York: Holt, Rinehart & Winston, 1969.
3. BANDURA, A., & KUPERS, C. Transmission of patterns of self-reinforcement through modeling. *J. Abn. & Soc. Psychol.*, 1964, **69**, 1-9.
4. BANDURA, A., & PERLOFF, B. Relative efficacy of self-monitored and externally imposed reinforcement systems. *J. Personal. & Soc. Psychol.*, 1967, **7**, 111-116.
5. BANDURA, A., & WHALEN, C. The influence of antecedent reinforcement and divergent modeling cues on patterns of self-reward. *J. Personal. & Soc. Psychol.*, 1966, **3**, 373-382.
6. BANDURA, A., GRUSEC, J., & MENLOVE, F. Some social determinants of self-monitoring reinforcement systems. *J. Personal. & Soc. Psychol.*, 1967, **5**, 449-455.
7. BLACKMAN, S. Some factors affecting the perception of events as chance determined. *J. of Psychol.*, 1962, **54**, 197-202.
8. CROMWELL, R., ROSENTHAL, D., SHAKOW, D., & KAHN, T. Reaction time, locus of control, choice behavior and description of parental behavior in schizophrenic and normal subjects. *J. Personal.*, 1961, **29**, 363-380.
9. DAVISON, G., & VALINS, S. Maintenance of self-attributed and drug-attributed behavior change. *J. Personal. & Soc. Psychol.*, 1969, **11**, 25-33.
10. EBERLY, B. The effect of stimulus meaningfulness and method of response determination on verbal discrimination learning. Unpublished Doctoral dissertation, Arizona State University, Tempe, 1971.
11. HUNTER, W. Experimental studies in learning. In C. Murchison (Ed.), *Foundations of Experimental Psychology*. Worcester, Mass.: Clark Univ. Press, 1929.
12. KANFER, F. Verbal conditioning: A review of its current status. In T. Dixon & D. Horton (Eds.), *Verbal Behavior and General Behavior Theory*. New York: Prentice-Hall, 1968.
13. KANFER, F., & DUERFELDT, P. Effects of pretraining on self-evaluation and self-reinforcement. *J. Personal. & Soc. Psychol.*, 1967, **7**, 164-168.
14. ———. Motivational properties of self-reinforcement. *Percept. & Motor Skills*, 1967, **25**, 237-246.
15. KANFER, F., & MARSTON, A. Conditioning of self-reinforcing responses: An analogue to self-confidence training. *Psychol. Rep.*, 1963, **13**, 63-70.
16. ———. Determinants of self-reinforcement in human learning. *J. Exper. Psychol.*, 1963, **66**, 245-254.
17. KANFER, F., & PHILLIPS, J. *Learning Foundations of Behavior Therapy*. New York: Wiley, 1970.
18. KANFER, F., BRADLEY, M., & MARSTON, A. Self-reinforcement as a function of degree of learning. *Psychol. Rep.*, 1962, **10**, 885-886.
19. LIEBERT, R., & ALLEN, M. Effects of rule structure and reward magnitude on the acquisition and adoption of self-reward criteria. *Psychol. Rep.*, 1967, **21**, 445-452.
20. McMAINS, M., & LIEBERT, R. Influence of discrepancies between successfully modeled self-reward criteria on the adoption of a self-imposed standard. *J. Personal. & Soc. Psychol.*, 1968, **65**, 381-386.
21. MARSTON, A. Imitation, self-reinforcement, and reinforcement of another person. *J. Personal. & Soc. Psychol.*, 1965, **2**, 255-261.
22. MISCHEL, W., & LIEBERT, R. Effects of discrepancies between observed and imposed reward criteria on their acquisition and transmission. *J. Personal. & Soc. Psychol.*, 1966, **3**, 45-53.
23. PHARES, E. Perceptual threshold decrements as a function of skill and chance expectancies. *J. of Psychol.*, 1962, **53**, 399-407.
24. ROTTER, J. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, **80** (1) Whole No. 609.

25. ROSENHAN, D., FREDERICK, F., & BURROWS, A. Preaching and practicing: Effects of channel discrepancy on norm internalization. *Child Devel.*, 1968, **39**, 291-301.
26. SEEMAN, M. Alienation and social learning in a reformatory. *Amer. J. Sociol.*, 1963, **69**, 270-284.
27. SKINNER, B. Science and Human Behavior. New York: MacMillan, 1953.
28. VINCENT, S. The function of the vibrissae in the behavior of the white rat. *Behav. Monog.*, 1912, **1**, 5.

Scottsdale Guidance Center
7300 Fourth Street
Scottsdale, Arizona 85281

Veterans Administration Hospital
Seventh Street and Indian School Road
Phoenix, Arizona 85012

THE RELATIONSHIPS AMONG PROFESSIONAL PERFORMANCE RATINGS, CLINICAL DECISIONS, AND CLINICAL OUTCOMES IN PSYCHIATRY* 1,2

*University of Connecticut, U. S. Navy Bureau of Medicine and Surgery,
and Navy Medical Neuropsychiatric Research Unit*

W. R. TAYLOR, D. E. BROWN, JR., DARREL EDWARDS,³
AND E. K. ERIC GUNDERSON

SUMMARY

When training backgrounds, ratings, and clinical practices among Navy psychiatrists were considered, a definite profile between rated competence and performance emerged. Doctors rated as highly competent were generally older and had more experience since training than did doctors with low-rated competence. High ratings were associated also with the ability of doctors to manage patients with relatively few drugs and few physical restraints. With respect to differences in management or major diagnostic groups, it appeared that ratings reflected agreement between clinical practices and administrative policies. Generally, it is assumed that fewer clinical hours and decisions should affect the character and behavior disorder group as compared with other diagnostic categories. High competence ratings were characteristic of doctors who followed this dictum. Although posthospital outcomes were not significantly related to ratings in the small samples of this study, a trend in this direction was evident. Ratings on the Professional Performance Report (PPR) appear to reflect the ability of the doctor to function well in a large organization while practicing effective patient management.

* Received in the Editorial Office on October 9, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Report number 71-17, supported by the Bureau of Medicine and Surgery, Department of the Navy, under Research work unit M4305.07-3005DGA5. Opinions expressed are those of the authors and are not to be construed as necessarily reflecting the official view or endorsement of the Department of the Navy.

² The invaluable technical assistance of Mrs. Doreen Brown, Miss Mary Savastano, and Mr. Frank Thompson is gratefully acknowledged.

³ Reprints are available from the third author at the address shown at the end of this article.

A. INTRODUCTION

Research on the efficacy of psychiatric concepts and practices is essential if etiology, treatment, and prevention of mental disorders are to be advanced. Recently, attention has been given to the role of the therapists' personality, attitudes, and competence as they affect clinical decisions in relation to outcomes of emotional illness in their patients (5, 6). A pilot study of 500 psychiatric patients at the Philadelphia Naval Hospital revealed marked differences among staff psychiatrists in major clinical decisions. The results suggested that clinical competence might account for differences in the decisions. Whatever the source, systematic differences in decision making processes might have important implications for clinical and administrative outcomes.

In the present study, routine hospital records and service files were carefully reviewed in order to document objectively clinical and administrative decisions and practices. In addition, an attempt was made to measure professional performance of staff psychiatrists and residents directly by obtaining ratings from superiors.

In an attempt to clarify the meaning of competence ratings in a psychiatric setting and to define those attributes of training and clinical decisions that lead to a high posthospital success rate, this study examined the relationships among (a) a measure of professional performance, (b) certain background characteristics of psychiatrists, (c) various clinical decisions and practices, and (d) posthospitalization outcomes for those patients returned to military duty.

B. METHOD

1. *Sample*

Thirteen staff and resident psychiatrists from the Philadelphia Naval Hospital were included in the study. They comprised the staffs of two administrative units, Unit I and Unit II. Each unit consisted of approximately 120 beds on three wards, one closed two open. The patients included in the study were admitted to the psychiatric service between September 1967 and January 1968.

2. *Competence Ratings*

Each psychiatrist was rated by his immediate superior on a series of rating scales, the Professional Performance Report (PPR). The raters were the administrative and clinical supervisors of the staff and residents who were rated. Each rater had direct contact with the work in the hospital of

each staff member and resident. It was assumed that the ratings would reflect the performance of the rated members in a direct way reflecting the supervisor's observations of the competence of the rated staff member and resident. Ratings were reviewed by the Chief of Service, which tended to increase the uniformity of evaluation standards across administrative units. The 19 items of the PPR are as follows: (a) basic preclinical knowledge, (b) clinical application of basic sciences, (c) thoroughness of history and physical examinations, (d) discriminatory use of laboratory, (e) clinical judgment, (f) general technical skill, (g) caliber of case presentation, (h) willingness to learn, (i) interest in teaching, (j) effectiveness as a teacher, (k) interest in clinical research, (l) rapport with other personnel, (m) rapport with patients, (n) efficiency in work organization, (o) promptness in work completion, (p) administrative ability, (q) caliber of work performance, (r) assumption of responsibility, and (s) military bearing and appearance. Each item was rated on a five point scale from "acceptable" to "outstanding." Ratings for one item, interest in clinical research, were given in so few cases that this scale was omitted from subsequent analyses. The remaining 18 items were highly intercorrelated, and it was considered appropriate to derive a single overall competence score for each psychiatrist by summing the rating values for these items. The PPR scores ranged from 33 to 76, with an average of 58.6.

C. RESULTS

1. *Characteristics of the Doctors*

The mean age for the total group was 29.6 years. The average amount of residency training was 4.0 years, and the average years of experience after residency training was 1.2 years. A majority of the group (eight out of 13) had been trained in private and university hospitals, and the remainder in public and military hospitals. Approximately one half (seven doctors) had received no personal psychotherapy prior to active Navy service, while six had received such training and three had received additional training in psychoanalysis. Generally, the younger psychiatrists (younger than 30) with less training and experience tended to be rated lower on the PPR (57.2) than older, more experienced psychiatrists (63.1). Examination of the scores across age groups showed that doctors who had residencies in public or military hospitals were rated higher (mean = 65.8) than those who had residencies in private or university hospitals (mean = 56.2). This result may reflect a relationship between similarity of training, rating environment, and rater affiliation.

2. *Rating and Clinical Practices*

The doctors were dichotomized into high and low PPR categories in such a way as to divide the total patient sample assigned to the doctor groups into approximately equal halves to check for the relationship among competence rating scores, clinical practices, and administrative decisions. The two units were comparable in physical environment, patient population, and administrative policies.

Doctors categorized as high competence rating group received PPR scores of 59 and above with a mean PPR score of 68.3. Doctors classified as low competence rating group had a mean PPR score of 44.7. Clinical practices and decisions were expected to differ between high and low competence rating groups. Table 1 summarizes the differences between high and low groups on clinical practices. The high competence group tended to use the closed ward a shorter time than did the low group. The high group also used the quiet room for patient control less often than did the low group. The high group tended to use no drugs in more cases and to use major drugs and minor drugs in fewer cases than did the low group. The low doctors used sleeping pills in almost twice as many cases as did the high doctors. Differences between groups on types of disposition from the hospital were not significant, reflecting the diagnostic impression that cases tended to be equivalent in terms of severity of disorder. In general, it appeared that high competence doctors had fewer problems with patient management than did the low competence doctors.

3. *Rating, Practices, and Diagnosis*

Clinical practices were expected to differ in a number of ways in treating major diagnostic groups, and it was expected that differences in "competence" would be associated with such differential treatment. Length of hospitalization and variations in drug use were of particular interest in the following major diagnostic groups: psychosis, psychoneurosis, and character and behavior disorder.

There were no differences between high and low groups for any diagnostic class on length of hospitalization. Both groups tended to keep psychotics the longest period of time, and character and behavior disorders the shortest time. Although the overall length of hospitalization was the same for the high and low doctors, only the high competence rating group spent more time with both neurotics and psychotics than with character and behavior disorders. Diagnosis was the prime consideration in accounting for length of hospitalization ($r = .31$). High rated doctors used major drugs more frequently and sleeping pills less frequently for psychotics than did low

TABLE 1
PATIENTS AFFECTED BY CLINICAL PRACTICES FOR HIGH AND LOW COMPETENCE DOCTORS

Clinical practice	High (<i>N</i> = 166 patients)	Low (<i>N</i> = 194 patients)	<i>p</i> ^a
Closed ward			
0 days	.086	.022	.006
Less than 7 days	.272	.262	—
More than 7 days	.642	.716	—
Use of quiet room			
Yes	.054	.133	.02
Drug types used ^b			
No drugs	.376	.278	.05
Major	.253	.346	.04
Minor	.056	.126	.03
Antidepressants	.056	.031	—
Sleeping pills	.244	.411	.002
Hospital days			
Psychosis	75.5	77.0	
Psychoneurosis	74.5	63.4	
Character and behavior disorder	55.1	61.9	
Use of drugs ^c			
Psychosis			
Major	.667	.475	.04
Sleeping pills	.196	.361	.06
No drugs	.098	.213	.10
Total drugs ^d	1.71	1.85	
Psychoneurosis			
Minor	.108	.273	.06
Total drugs ^d	1.06	1.32	
Character and behavior disorder			
Thorazine	.181	.297	.07
Sleeping pills	.181	.469	.001
Total drugs ^d	.888	1.29	.07

^a Probability level for differences between High and Low proportions (two-tailed test).

Probabilities greater than .10 are not shown.

^b More than one drug may be used per patient.

^c Expressed as proportion of population receiving class of drug.

^d Expressed as the number of drugs divided by the number of patients.

competence doctors. Low competence rated doctors used minor drugs more frequently with neurotics than did the high competence rated group. With character and behavior disorders, low rated doctors used sleeping pills almost three times as frequently as did high rated doctors and used more total drugs for that diagnostic group. In summary, the high rated group followed the rules of sound clinical practices as outlined in the literature (1, 2).

4. Ratings, Practices, and Outcomes

All cases that were returned to military duty were followed up by means of administrative and medical records for approximately two years after initial hospitalization in order to evaluate the relationships between (a)

competence ratings and outcomes and (b) performance and outcome. A patient was classified a success if he was (a) still on active duty after two years, (b) discharged from active duty after completion of his enlistment with recommendation for re-enlistment, or (c) retired to the Fleet Reserve after the prescribed length of service. The patient was judged to have failed if he was (a) rehospitalized for psychiatric reasons, (b) not recommended for reenlistment at the expiration of his enlistment, or (c) separated prematurely from the service in any way. Since pay grade has been shown to be related to probability of success after hospitalization (4), samples matched by pay grade were compared in addition to the analysis of the total sample. One doctor (PPR = 75) from the high group returned no patients to duty and was eliminated from the analysis.

There were no significant differences in success rate between high and low groups ($p > .20$). It would appear that competence ratings, reflecting supervisors' judgments of excellence, were related to the doctors' clinical behavior on the ward, but a relationship between rated competence and posthospital success was not demonstrated.

An examination of the relationship between the doctors' decisions and patient outcomes across PPR scores produced a similar clinical pattern. The more frequently physical restraint was required for the patient, the less often the patient would be a success at duty ($r = .31$). In addition, frequent changes in medication ($r = .54$), large initial doses of any drug ($r = .65$), and prolonged drug treatment ($r = .35$), were related to outcome failures. These relationships were found for a Navy enlisted sample in which diagnosis was controlled. All of the men in the effective-noneffective sample were carefully selected for return to duty, and diagnosis was no longer a salient variable. Finally, one facet of the decisions which was indicative only of the high competence group was the sensitivity of the doctors to service related variables that were correlated to success for their group—pay grade ($r = .35$), good disciplinary history ($r = .51$), age ($r = .21$), and years service ($r = .27$).

D. DISCUSSION

The results suggest that the more experienced doctors were rated higher and demonstrated better patient management than did the lower rated doctors with less experience. The higher rated doctors used locked facilities less often and were more selective in their use of drugs. It also appeared that the higher rated doctors spent a smaller portion of their time with character and behavior disorders and were less willing to give drugs to this

class of patients. Anecdotal data would indicate that more experienced doctors are not impressed by the typical antics of the character and behavior disorder patient.

The results indicate that experience leads to a refining of clinical strategies and that ratings of "competence" by supervisors tend to reflect these ward clinical behaviors. In terms of patient management, competence ratings and concomitant clinical practices would seem to be of practical importance, although further analysis is needed to uncover these parameters of clinical decisions that maximize posthospital adjustment.

One surprising result in the present analysis was the high proportion of successes among nonrated patients (pay grades E1 through E3). The Navy success rate for nonrated patients, as determined by a sample of 2351 cases returned to duty from psychiatric units in major naval hospitals, was 33.7% (3). Philadelphia cases included in this study had an overall success rate of 62.3% for nonrated patients. All units were close to the Navy-wide success rate for petty officers (pay grades E4 through E9) of 61.4%. This relatively high success rate with nonrated patients suggested that there were factors operating in the psychiatric service at this hospital independent of doctors' competence that were affecting selection for return to duty and treatment of those patients in the hospital.

It is clear that psychiatrists can make decisions that result in posthospital adjustment to service. Any clinical behaviors that may be construed to reflect management problems or poor patient response to treatment (frequent use of the quiet room, many changes of medications, large drug doses, or prolonged drug treatment) discriminate between effective and ineffective return to duty adjustment.

It is also clear that differences in "competence" ratings reflect in-house clinical behavior and perhaps the integration of clinical decisions with the administrative decisions demanded by the clinical setting. Since such ratings of performance as tested in this study were not related to a patient outcome criterion, other behavioral measures of performance need to be explored that differentiate between that clinician who was the most successful predictor of effectiveness (89%) and those who were poorer predictors (50%).

REFERENCES

1. ARIETI, S. *American Handbook of Psychiatry* (Vol. II). New York: Basic Books, 1959.
2. ———. *American Handbook of Psychiatry* (Vol. III). New York: Basic Books, 1966.

3. BERRY, N. H., EDWARDS, D., IORIO, V., & GUNDERSON, E. K. E. A study of Navy and Marine Corps personnel admitted to the psychiatric sick list. Report No. 72-1, Navy Medical Neuropsychiatric Research Unit, San Diego, California, 1972.
4. CLUM, G. A., & HOIBERG, A. Biographical variables and post-hospitalization adjustment of psychiatric patients in the naval service. *Military Med.*, 1970, **135**, 177-181.
5. HOLT, R. R., & LUBORSKY, L. Personality Pattern of Psychiatrists (Vols. I & II). New York: Basic Books, 1958.
6. MELTZOFF, J., & KORNREICH, M. Research in Psychotherapy. New York: Atherton, 1970.

Navy Medical Neuropsychiatric Research Unit
San Diego, California 92152

SEX ROLES, TASK COMPETENCE, AND CONFORMITY*¹

Indiana University-Purdue University at Indianapolis

CARLOS GOLDBERG

SUMMARY

The purpose of the investigation was to determine the relative importance of sex roles and task competence as regards the relationship between sex and conformity.

The Ss in Study I were 68 American students; half were male, and the other half female. The Ss were tested by means of a Conformity Instrument and a Masculinity-Femininity scale. The results show that task competence acts as a between-sex factor in that females conformed more than males only on masculine items, but on feminine items the opposite was the case. However, sex role acts as a within-sex factor, since, in general, feminine females and males conformed more than masculine males and females.

The Ss in Study II were 19 female members of the National Organization of Women (NOW) and 12 control females. The NOW Ss conformed less than the control Ss, but the two groups obtained similar scores on the femininity scale.

It can be said that the nature of the task is indeed an important variable in the relationship between sex and conformity, but sex role remains a crucial variable in determining conformity; i. e., the greater the rejection of the conventional feminine role, manifested through psychological masculinity or active involvement with the women's movement, the lesser the degree of conformity.

A. INTRODUCTION

Most investigators find that American females conform more than American males under a variety of experimental conditions (1, 3, 4, 6, 7, 8, 11, 12, 14, 15, 17, 18, 22, 23, 24). The relationship between sex and conformity is

* Received in the Editorial Office on October 10, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ I would like to thank Teresa Harper for her most able assistance at various stages of the investigation. I would also like to thank Dr. J. Norton for his assistance with the statistical analyses. Computer service was provided by the IUPUI Computing Facilities.

most often attributed to differences in the socialization of males and females. Krech, Crutchfield, and Ballachey (16), for example, suggest that the socialization of females emphasizes dependence upon the group and submissiveness to the male, whereas the male in our culture is taught to be self-sufficient and independent in thought.

Several recent studies, however, do not find differences in conformity between males and females (2, 5, 9, 13, 19, 21). Sistrunk and McDavid (21) have argued that the heretofore stable relationship between sex and conformity may have been due to an experimental artifact; viz., most investigators tend to use experimental tasks, such as the judgment of lines, which may be more relevant to males as compared to females, and consequently females conform more than males. In their own work, Sistrunk and McDavid have controlled for this possible artifact; viz., some of their items are more relevant to males, some are more relevant to females, and some are equally relevant to both sexes. Their results do seem to indicate that females conform more than males only on masculine items, but on feminine items either males conform more than females or there is no difference in conformity between the sexes; in general, there was also a tendency for both sexes to conform to the same extent on the neutral items.

Sistrunk and McDavid seem to be implying that the most crucial variable in this area is the Ss' perception of their own competence or expertise with regard to the task; i. e., on masculine items, females feel less competent or certain, and consequently they tend to conform more to majority pressure, whereas on feminine items females feel more competent and tend to conform less than males (*cf.* 16, p. 510). Although the authors admit that cultural prescriptions account for part of the variance in the relationship between sex and conformity, they claim that most of the variance can be accounted for by personality factors, the situation, and the nature of the task.

We believe that Sistrunk and McDavid have underplayed the importance of cultural prescriptions, and the present study was an attempt to determine the relative importance of cultural prescriptions and task competence with respect to the relationship between sex and conformity.

In general, we expect that the greater the endorsement of the conventional feminine role on the part of females, the greater the conformity; i. e., although both feminine-females (*cf.* 10) and masculine-females may conform less than males on feminine items, feminine-females will conform more than masculine-females. In other words, task competence will manifest it-

self as a between-sex factor, but cultural prescriptions will yield differences in conformity within the same sex. By the same token, feminine-males should, in general, conform more than masculine-males. It is also expected that females who are actively involved with Women's Liberation, inasmuch as they tend to reject the conventional feminine role, will conform less than females who are indifferent to the women's movement.

B. GENERAL METHOD

1. *Conformity Instrument*

Sistrunk and McDavid's (21) questionnaire was used to measure conformity. We selected 10 masculine items, 10 feminine items, 10 neutral items, and 20 filler items from the original questionnaire. Pressures toward conformity were introduced by indicating on the booklet how the majority of a previous sample answered each item in the questionnaire.

2. *Masculinity-Femininity*

The short version of Gough's (10) Masculinity-Femininity scale was used in the study. There are 38 items in the scale, where the higher the score the greater the psychological femininity.

C. STUDY I

1. *Subjects*

The subjects were 68 American students attending Indiana University-Purdue University at Indianapolis; 34 of the Ss were male and 34 were female.

2. *Procedure*

A booklet containing the Conformity Instrument and the Masculinity-Femininity scale was administered to 238 students attending Introductory Psychology. The median score for the Masculinity-Femininity scale was 19.5, and Ss scoring above the median were classified as feminine, while those scoring below the median were classified as masculine. This classification yielded four groups with 17 Ss per group: viz., Male-Masculine, Male-Feminine, Female-Masculine, and Female-Feminine. Thus, sex of subjects and masculinity-femininity served as between-subjects factors, and type of item in the Conformity Instrument served as the within-subject factor in the $2 \times 2 \times 3$ mixed-effects factorial design.

3. *Results and Discussion*

Table 1 presents the mean conformity scores of the four groups for each type of item.

TABLE 1
MEAN CONFORMITY SCORES AS A FUNCTION OF SEX,
MASCULINITY-FEMININITY, AND TYPE OF ITEM

Group	Masculine	Type of item Feminine	Neutral
Male			
Masculine	4.59	4.71	5.18
Feminine	5.35	5.41	4.65
Female			
Masculine	6.06	3.94	6.29
Feminine	6.59	3.88	5.65

The analysis of variance (25) did not yield a significant main effect due to Sex, but the Sex \times Item interaction was statistically significant ($F = 14.48$, $df = 2/128$, $p < .01$); by Tukey's procedure (25), females conformed more than males on masculine and neutral items, but males conformed more than females on feminine items. These results essentially replicate the findings obtained by Sistrunk and McDavid (21) with one exception; viz., in one of their studies, it was the males who conformed more than the females on the neutral items.

The main effect due to psychological Femininity was not significant, but the Femininity \times Item interaction was statistically significant ($F = 3.18$, $df = 2/128$, $p < .05$); feminine Ss conformed more than masculine Ss on masculine and feminine items, but on neutral items it was the masculine Ss who conformed more than the feminine Ss (*cf.* 20).

By means of Tukey's procedure, the mean conformity scores of the four groups were compared for each type of item. On the feminine items both female groups conformed less than the two male groups, but contrary to expectation, there was no difference in conformity between the feminine-female Ss and the masculine-female Ss. However, the feminine-male group conformed more than the masculine-male group (see Table 1).

On the masculine items both female groups conformed more than the two male groups, and the feminine-female Ss conformed more than the masculine-female Ss; furthermore, the feminine-male group conformed more than the masculine-male group.

On the neutral items both female groups conformed more than the two male groups, but contrary to expectation, the masculine-female Ss con-

formed more than the feminine-female Ss; in addition, the masculine-male Ss also conformed more than the feminine-male Ss.

If we consider the results on all three types of items, there does not seem to be a systematic relationship between psychological femininity and conformity. However, a case can be made that the neutral items may be intrinsically unstable; e. g., Sistrunk and McDavid found that in three out of four studies there was no difference in conformity on the neutral items between males and females, with males conforming more on the exception, but in the present study it is the females who conform more than the males on the neutral items. Furthermore, Sistrunk (20) found no difference in conformity on the neutral items between feminine and masculine Ss, but the present study finds that masculine Ss conform more than the feminine Ss on the neutral items.

Thus, if we disregard the results on the neutral items, the obtained findings suggest that cultural prescriptions play a larger role in determining conformity than Sistrunk and McDavid are willing to concede; viz., disregarding sex, feminine Ss conformed more than masculine Ss on feminine items as well as on the masculine items; feminine-male Ss conformed more than masculine-male Ss on the feminine items as well as on the masculine items; and finally, feminine-female Ss conformed more than masculine-female Ss on the masculine items. The exception to this pattern of results is that there was no difference in conformity on the feminine items between the two female groups.

D. STUDY II

1. *Subjects*

The subjects were 19 female members of the local chapter of the National Organization of Women (NOW) and 12 females who served as the control group. The two groups were similar with respect to educational and socioeconomic background.

2. *Procedure*

The booklet containing the Conformity Instrument and the Masculinity-Femininity scale was administered to 19 females attending a meeting of the local chapter of NOW. These Ss were then asked to indicate names of neighbors who were not involved with the women's movement. The latter Ss were approached individually at their homes, and 12 of them agreed to answer the questionnaire.

3. *Results and Discussion*

The control group conformed significantly more than the NOW group ($F = 4.21$, $df = 1/29$, $p < .05$); the respective means were 13.58 and 10.05. Although there was a tendency for the control Ss to be more feminine than the NOW Ss, the mean difference was not statistically significant; the mean for the control group was 23.42, and the mean for the members of NOW was 21.32.

The results, then, support the expectation that females who question the conventional feminine role are less likely to yield to majority pressure.

It is interesting to note that although NOW women conformed less than the control Ss, the two groups obtained similar scores on the femininity scale. This suggests that the rejection of a social role may first be reflected in the outward manifestations of that role, such as conformity; i. e., it may take longer to restructure the inner core of the feminine role. On the other hand, the obtained pattern of results may merely be an accurate reflection of the aims of NOW; i. e., perhaps members of NOW are primarily concerned with the outward manifestations of the feminine role rather than with its core elements. In this regard, it would be interesting to see how more radical women's groups would score on the femininity scale.

E. GENERAL DISCUSSION

The present study replicated the findings obtained by Sistrunk and McDavid (21). Thus, females did not conform more than males indiscriminately, and the nature of the task is indeed an important variable in the relationship between sex and conformity. On the other hand, the present study provides evidence for the traditional view that cultural prescriptions for sex roles are crucial variables in determining conformity. In general, it was found that within the same sex, the feminine Ss tended to conform more than the masculine Ss. Furthermore, females who are actively involved with the women's movement conformed less than females who are indifferent to the movement.

Goldberg (9) using Asch's lines did not find any differences in conformity between males and females. It should be noted that Goldberg used Es and confederates of the same sex as the S. However, in the past Tuddenham, MacBride, and Zahn (23) found that females conformed more than males even when the confederates were of the same sex as the Ss.

The question, then, remains as to why in the past females conformed more than males when given visual problems, but at the present there is no difference in conformity as a function of sex with the same type of task.

One could argue that in the past decade females have become as familiar as males with the type of visual problems used by Asch (3) and others, and consequently females have as much confidence as males in their judgment of lines. In other words, the task has now become as relevant to females as it is to males. On the other hand, it is reasonable to assume that there has been a restructuring of the feminine role in American society in the direction of greater independence, and females will not conform more than males unless the task is clearly masculine and outside the female's expertise. In this regard, it would be interesting to determine whether the findings obtained by Constanzo and Shaw (5) are still applicable today. These authors found a nonlinear relationship between conformity and age for both sexes; i. e., there is an increase in conformity from the preadolescent period to the adolescent period, but conformity decreases during adolescence and decreases further in early adulthood. It may turn out to be the case that at the present time it would be the adolescent group that conforms less than the young adult group; i. e., if there has indeed been a change in the feminine role in the direction of greater independence, it would be the adolescent group that would have been most exposed to these changes, as compared to the young adult group, and consequently the former group should conform less than the latter.

REFERENCES

1. ALLEN, V. L., & CRUTCHFIELD, R. S. Generalization of experimentally reinforced conformity. *J. Abn. & Soc. Psychol.*, 1963, **67**, 326-333.
2. ALLEN, V. L., & LEVINE, J. M. Consensus and conformity. *J. Exper. Soc. Psychol.*, 1969, **5**, 389-399.
3. ASCH, S. E. Studies of independence and conformity: A minority of one against a unanimous majority. *Psychol. Monog.*, 1956, **70** (9), Whole No. 416.
4. CARRIGAN, W. C., & JULIAN, J. W. Sex and birth-order differences in conformity as a function of need affiliation arousal. *J. Personal. & Soc. Psychol.*, 1966, **3**, 479-483.
5. CONSTANZO, P. R., & SHAW, M. E. Conformity as a function of age level. *Child Devel.*, 1966, **37**, 967-975.
6. CROWNE, D. P., & LIVERANT, S. Conformity under varying conditions of personal commitment. *J. Abn. & Soc. Psychol.*, 1963, **66**, 547-555.
7. CRUTCHFIELD, R. S. Conformity and character. *Amer Psychol.*, 1955, **10**, 191-198.
8. ENDLER, N. S. Conformity as a function of different reinforcement schedules. *J. Personal. & Soc. Psychol.*, 1966, **4**, 175-180.
9. GOLDBERG, C. Conformity as a function of sex, task difficulty, and majority size. Unpublished manuscript, Indiana University-Purdue University, Indianapolis, 1970.
10. GOUGH, H. G. Identifying psychological femininity. *Educ. & Psychol. Meas.*, 1952, **12**, 427-439.
11. HOLLANDER, E. P., JULIAN, J. W., & HAALAND, G. A. Conformity process and prior group support. *J. Personal. & Soc. Psychol.*, 1965, **2**, 852-858.

12. ISCOE, I., & WILLIAMS, M. S. Experimental variables affecting the conformity behavior of children. *J. Personal.*, 1963, **31**, 234-246.
13. ISCOE, I., WILLIAMS, M., & HARVEY, J. Age, intelligence, and sex as variables in the conformity behavior of Negro and white children. *Child Devel.*, 1964, **35**, 451-460.
14. JANIS, I. L., & FIELD, P. B. Sex differences and personality factors related to persuasibility. In I. L. Janis *et al.* (Eds.), *Personality and Persuasibility*. New Haven: Yale Univ. Press, 1959.
15. KANAREFF, V. T., & LANZETTA, J. T. Effects of success-failure experiences and extinction of an imitative response. *Psychol. Rep.*, 1960, **7**, 151-166.
16. KRECH, D., CRUTCHFIELD, R. S., & BALLACHEY, E. L. Individual in society. New York: McGraw-Hill, 1962.
17. NAKAMURA, C. Y. Conformity and problem solving. *J. Abn. & Soc. Psychol.*, 1958, **56**, 315-320.
18. PATEL, A., & GORDON, J. E. Some personal and situational determinants of yielding to influence. *J. Abn. & Soc. Psychol.*, 1960, **61**, 411-418.
19. SISTRUNK, F. A comparison of the socially influenced behavior of college students and college-age dropouts. *Psychon. Sci.*, 1969, **15**, 214-215.
20. ———. Masculinity-femininity and conformity. *J. Soc. Psychol.*, 1972, **87**, 161-162.
21. SISTRUNK, F., & McDAVID, J. W. Sex variable in conforming behavior. *J. Personal. & Soc. Psychol.*, 1971, **17**, 200-207.
22. TUDDENHAM, R. D. The influence of a distorted group norm upon individual judgment. *J. of Psychol.*, 1958, **46**, 227-241.
23. TUDDENHAM, R. D., MACBRIDE, P., & ZAHN, V. The influence of the sex composition of the group upon yielding to a distorted norm. *J. of Psychol.*, 1958, **46**, 243-251.
24. WALKER, W. L., & HEYNS, R. W. An anatomy for conformity. Englewood Cliffs, N. J.: Prentice-Hall, 1962.
25. WINER, B. J. Statistical principles in experimental design (2nd Ed.). New York: McGraw-Hill, 1971.

Psychology Department
Indiana University-Purdue University
1201 East 38 Street
Indianapolis, Indiana 46205

THE GENERAL SURVEY: A SHORT MEASURE OF FIVE PERSONALITY DIMENSIONS* 1,2

*Department of Political Science, University of North Carolina;
Department of Sociology, University of Capetown, South Africa;
Institute of Psychiatry, London, England*

HERBERT M. KRITZER, A. PAUL HARE, AND HERBERT H. BLUMBERG

SUMMARY

This paper describes a short personality measure which requires about 10 minutes to complete and taps five separate personality dimensions. While the number of items on each scale is very small, the scales have adequate split-half reliabilities and adequate test-retest reliabilities.

A. INTRODUCTION

In field research situations it is often desirable to have measures of various personality dimensions. This is often precluded by the length of most of the common personality instruments (e.g., MMPI, EPPS, OPI, etc.) which require an hour or longer to complete. Finding a briefer personality instrument was the motivation behind the development of the General Survey (GS). For the purposes of a large research project on the social-psychological aspects of nonviolence (7), it was desirable to have an instrument that tapped five dimensions of personality (aggression, anxiety, authoritarian conformity, extraversion, and verbal intelligence), that could be administered in 15 minutes or less, and that could be reproduced on a single sheet of paper. The instrument was intended to be used at large gatherings of people, such as rallies and training sessions, with English speaking subjects. The primary population to be tested was the relatively well educated participants in the peace movement in the United States.

B. DEVELOPMENT

For the measure of verbal intelligence, it was decided to begin with the 100 item Quick Word Test described by Borgatta and Corsini (3) and to

* Received in the Editorial Office on October 10, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Work supported by NIMH grant No. 5 R01 MH17421-02 SP.

² For reprints, readers may write to any of the addresses shown at the end of this article.

try to find a reliable and valid subset of words that could be used alone. The 100 item instrument was administered to an American sample of male undergraduates. The best subset of items was the second quarter of the total instrument (see Table 1). This quarter correlated .88 with the 100 item test; had a split-half reliability, for this initial test sample, of .81; and correlated .76 with the subjects' SAT Verbal scores (*versus* only .70 for the entire 100 word score).

The initial item pool for the other four dimensions was taken from the work of Couch (4) and Bales (1). These items were administered to the same undergraduate sample and factor analyzed. A subset of items was selected for three of the dimensions—conformity, aggression, and anxiety—on the basis of the results of the factor analysis. No coherent set of extra-

TABLE 1
ITEMS FOR GENERAL SURVEY INTELLIGENCE SCALE^a

DIRECTIONS: Draw a dark line THROUGH the word that means about the same as the first word. When you don't know the right one, GUESS. Work quickly, and ANSWER ALL THE QUESTIONS.

genre	<i>sort</i>	peer	waft	norm
force	<i>dint</i>	cope	grit	wade
chafe	cook	hilt	dish	<i>fret</i>
crook	jail	<i>bend</i>	lout	deal
craft	<i>wile</i>	rank	sail	tool
vault	<i>leap</i>	pyre	hide	turn
shift	<i>veer</i>	gear	flit	ride
wheel	dish	<i>wale</i>	fire	turn
avast	<i>stop</i>	heap	huge	hole
cleek	lick	ooze	pure	<i>club</i>
spare	<i>thin</i>	tire	rend	send
sting	whip	ring	<i>goad</i>	part
small	pint	<i>mean</i>	meek	safe
barge	vast	pull	<i>bark</i>	abet
brace	rash	clan	<i>pair</i>	hard
ingot	gold	rich	<i>mold</i>	earn
vapid	fume	mist	<i>dull</i>	fast
heave	load	<i>lift</i>	stab	knit
acerb	plot	<i>sour</i>	edge	roan
hover	<i>flit</i>	shed	arab	roam
stile	foul	onum	<i>step</i>	wall
stead	rely	<i>lieu</i>	foal	bear
reign	stem	fall	ride	<i>sway</i>
found	luck	seek	<i>base</i>	held
verve	dare	leap	<i>elan</i>	pert

^a The score for this measure is equal to the number of correct responses *plus* 1/5 the number of items not answered. The correct responses are in italics.

version items could be found in this first analysis; consequently, a number of items were taken from another personality instrument (6) which included a social extraversion scale. These items, along with the items selected through the previous factor analysis, were administered to several additional samples. The responses were factor analyzed, and from these analyses the final selection of items was made. Table 2 shows the items and the factor loadings based upon the criterion samples shown in Table 3.

The items in this instrument are Likert-type statements, with responses from strongly disagree to strongly agree. The responses are coded along a seven point scale, with nonresponses, "unsures," question marks, etc. coded as the neutral point 4. In scoring the scales, negative items (indicated in Table 2) are scored by reflection rather than subtraction; that is, the coded responses of the items to be scored in the negative direction are first subtracted from 8, and then added to the scale score. A high score on the authoritarian conformity scale indicates a high level of authoritarianism; a high score on the aggression scale indicates a high level of aggression; a high score on the anxiety scale indicates a high level of anxiety; and a high score on the extraversion scale indicates a high level of social extraversion.

C. VALIDITY AND RELIABILITY

Validity was tested in two ways. For one of the samples of male undergraduates, a variety of other personality measures were available, including the Omnibus Personality Inventory (6) and a number of measures developed by Perloe (8, 9, 10). The OPI was administered eight months prior to the GS, and Perloe's scales were administered immediately prior to the GS. (These tests were administered as part of a regular college testing program, in the case of the OPI, and as part of an entirely separate research project, in the case of Perloe's scales. Both the OPI and Perloe's instrument require one to two hours to administer as opposed to 10 to 15 minutes for the General Survey.) The GS anxiety scale correlated $-.62$ with the OPI Anxiety Level scale which indicates a denial of being worried about things. The GS extraversion scale correlated $.59$ with the OPI Social Extroversion scale. The GS authoritarian conformity scale correlated $.68$ with Perloe's F scale measure which indicates an aggressive ethnocentrism and intolerance of deviance; it also correlated $-.64$ with the OPI Autonomy scale and $.66$ with the OPI Practical Outlook scale. As was noted above, the GS verbal intelligence scale correlated $.76$ with SAT Verbal scores obtained from one to four years prior to the administration of the General Survey. None of the other instruments had a scale purporting to measure aggression. The strongest correla-

TABLE 2
FACTOR LOADINGS FOR FOUR GENERAL SURVEY SCALES^a

Item no.	Factor loading	Scoring direction	Item
<i>Authoritarian conformity</i>			
3	.492	+	Our modern industrial and scientific achievements are signs of a greater degree of success than that attained by any previous society.
8	.661	+	The most important function for education is preparation for practical achievement and financial reward.
14	.667	+	Young people sometimes get rebellious ideas, but as they grow up they ought to get over them and settle down.
16	.644	+	There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.
18	.649	+	A well-raised child is one who doesn't have to be told twice to do something.
23	.682	+	Patriotism and loyalty are the first and the most important requirements of a good citizen.
26	.686	+	What youth needs most is strict discipline, rugged determination, and the will to work and fight for family and country.
28	.817	+	Obedience and respect for authority are the most important virtues children should learn.
<i>Aggression</i>			
2	-.431	-	Most people that you meet are friendly and obliging, more disposed to aid you than to refuse aid.
6	-.740	-	People will be honest with you as long as you are honest with them.
7	-.653	-	Trust others to the limit, and they will trust you to the limit.
9	-.594	-	If you have faith in your friends, they will seldom disappoint you.
13	-.448	-	Most people are generous in their judgments of your actions and are inclined to give you the benefit of a doubt.
15	-.651	-	Believe that a man will keep his promise, and he will keep it.
19	-.588	-	Only once in a great while, if at all, does one run into a dishonest and deceitful person.
<i>Anxiety</i>			
4	.673	+	I brood a great deal.
10	.480	+	I wish I could be as happy as others seem to be.
11	-.541	-	I very seldom have spells of the blues.
12	.443	+	At times I think I am no good at all.

^a The possible responses for these items are as follows: 1 (strongly disagree), 2 (disagree), 3 (slightly disagree), 5 (slightly agree), 6 (agree), and 7 (strongly agree). Non-responses, question marks, unswers, don't knows, etc. are coded as 4.

TABLE 2 (continued)

Item no.	Factor loading	Scoring direction	Item
21	.560	+	I worry quite a bit over possible misfortunes.
25	.544	+	I feel anxiety about something or someone almost all the time.
29	.613	+	I sometimes feel overwhelmed with anxiety.
<i>Extraversion^b</i>			
1	.491	+	I enjoy being in a crowd just to be with people.
5	.269	+	If I encounter a group of people whom I have met previously, I begin a conversation with them.
17	.550	+	I do not avoid large gatherings of people.
20	.273	+	I like to serve as a member of a committee in carrying out some activity or project.
22	-.434	-	I prefer to visit with one person rather than with a group of people.
24	-.465	-	I prefer to stay at home rather than attend social affairs.
27	-.188	-	I work better when I am not being observed by others.
30	-.306	-	I am introverted, serious, shy, introspective.

^b Since extraversion is a balanced scale, a "yea-saying" measure may be obtained by scoring all eight extraversion items in the same direction.

tion for the GS aggression score was with one of Perloe's scales, described in Robinson and Shaver (10), which indicated a "rejection of the optimistic view of the fundamentally cooperative character of man"; the correlation with this scale was .43.

Validity was also tested by collecting responses from a diverse set of criterion groups. Table 3 shows the results from each of these samples, along with the average age and education of each group. The prison inmates were expected to be high in conformity and high in aggression. The seminarians were expected to be low in aggression and high in extraversion. The psychiatric patients were expected to be high in conformity and high in anxiety. The trainers were expected to be low in conformity and high in extraversion. The other populations are included for purposes of comparisons. The simple analyses of variance at the bottom of Table 3 indicate that significant differences exist between groups for all five of the personality dimensions. These results tend to indicate that the General Survey has the validity necessary for research purposes, though certainly not for diagnostic purposes.

Split-half and test-retest reliabilities were computed from two of the samples in Table 3. The reliability coefficients are shown in Table 4. The coefficients are not as high as is generally expected, but given the length of

TABLE 3
MEAN SCORES FOR CRITERION SAMPLES

Sample	<i>n</i>	Education	Age	Conformity	Aggression	Anxiety	Extraversion	Intelligence
Prison inmates	150	10.1	28.1	36.4	32.6	25.2	33.6	7.03
Seminarians	23	13.7	21.0	24.4	24.5	21.7	38.5	10.87
Psychiatric patients (anxiety neurotics)	33	11.2	28.5	37.1	28.1	33.4	34.9	6.31
Large urban university graduate students	11	16.7	26.9	21.4	29.3	20.1	39.0	11.90
Trainers for nonviolent direct action	70	15.7 ^a	31.4	14.6	23.0	20.2	38.8	13.69
Freshman at small under- graduate college	98	12.0	17.9	25.6	27.4	27.4	36.0	12.20
British nonviolent action trainees	25	16.1 ^a	25.8	15.0	25.3	26.5	36.0	14.50
Large urban university undergraduate students	184	14.0 ^a	20.0 ^a	24.0	30.1	25.1	34.7	8.73
American nonviolent action trainees	147	14.2 ^a	27.2	15.8	25.3	23.1	35.2	12.82
One-way analysis of variance (<i>F</i>)				91.25	16.08	10.90	4.43	38.03
Probability less than				.0001	.0001	.0001	.0050	.0001

^a Estimated from category data.

TABLE 4
RELIABILITY COEFFICIENTS FOR THE GENERAL SURVEY

Scale	Split-half ^a	Test-retest ^b
Aggression	.78	.71
Anxiety	.79	.79
Conformity	.72	.52
Extraversion	.56	.81
Verbal intelligence	.83	.79

^a Includes Spearman-Brown correction. Data were collected from a sample of persons attending a conference on training for nonviolent action at Pendle Hill ($n = 70$).

^b These are simple correlation coefficients for two administrations of the General Survey approximately two months apart. The data were collected as part of a mail survey of persons who had participated in programs of training for nonviolent action ($n = 63$).

the scales they are very good. The weakest scale is the extraversion scale; this may be a result of the weakness of the items used, or it may be that extraversion is not a unitary dimension.

E. USES TO DATE

It was originally intended to employ the General Survey at the scene of rallies and other forms of protest; for reasons other than the nature of the instrument, this was not possible. The instrument was used in other field situations, including conferences and training sessions for nonviolent action. Two uses of the instrument have been analyzed to date. The first of these was an experiment in roleplaying and persuasion (5); the analysis revealed no important relationships between personality and behavior. The second use was as part of a mail survey which sought to evaluate a number of training programs for nonviolent action (2); this analysis found (p. 6) that "personality and background variables may act as a filter for who decides to receive training, but these variables do not seem to matter much among the people actually in a training group." One interesting exception to this generalization is that "trainees who scored low on aggression were more likely to find that the training increased their commitment to nonviolence" (p. 6).

REFERENCES

1. BALES, R. F. *Personality and Interpersonal Behavior*. New York: Holt, Rinehart & Winston, 1970.
2. BLUMBERG, H. H., HARE, A. P., FULLER, C., WALKER, C., & KRITZER, H. M. Evaluation of some training programs for nonviolent direct action. Paper presented at the Fourth International Congress of Social Psychiatry, Jerusalem, Israel, May 21-26, 1972.

3. BORGATTA, E. F., & CORSINI, R. S. The quick word test (QWT) and the WAIS. *Psychol. Rep.*, 1960, 6, 201.
4. COUCH, A. S. Psychological determinants of interpersonal behavior. Unpublished Ph.D. dissertation, Harvard University, Cambridge, Massachusetts, 1960.
5. HARE, A. P., KRITZER, H. M., & BLUMBERG, H. H. Persuasive interaction: A role-playing experiment. Paper presented at meetings of the Eastern Sociological Society, Boston, Massachusetts, April, 1972.
6. HEIST, P., & YONGE, G. OPI Inventory, Form F, Manual. New York: Psychol. Corp., 1962.
7. KRITZER, H. M. The nonviolent action research project: A look in retrospect. Paper presented at meeting of the Peace Society (International), Southern Section, Lake Cumberland, Kentucky, April 18-21, 1973.
8. PERLOE, S. I. Authoritarianism, antinomianism, and affiliation among college students. *Proc. 78 Ann. Conven. APA*, 1970, 325-326.
9. ———. Changes in student's values and roles at college. Unpublished report (to the National Institute of Mental Health), Haverford College, Haverford, Pennsylvania, 1971.
10. ROBINSON, J. P., & SHAVER, P. R. Measures of Social Psychological Attitudes. Ann Arbor, Mich.: Survey Res. Center, Inst. for Soc. Res., 1969. Pp. 492-501.

Department of Political Science
University of North Carolina
Chapel Hill, North Carolina 27514

Department of Sociology
University of Capetown
Capetown, South Africa

Institute of Psychiatry
University of London
London SE5 8AF, England

A PRELIMINARY NOTE ON THE MOTIVE TO AVOID SUCCESS AND THE MENSTRUAL CYCLE*

Wake Forest University and University of Nebraska

ROSEMARIE ANDERSON PATTY AND MARCIA M. FERRELL^{1,2}

SUMMARY

Women in the premenstrual phase of their menstrual cycle were more likely to evidence the motive to avoid success on a projective assessment than women in the intermenstrual phase. No clear pattern emerged for women who were menstruating at the time of assessment. Alternative explanations focusing on a woman's attitude towards menses and/or emotional fluctuations as a reflection of hormonal changes are discussed.

A. INTRODUCTION

The motive to avoid success, conceptualized within an expectancy-value theory of motivation, focuses on the expectation that success will be followed by negative consequences or negative affect. The motive to avoid success particularly characterizes those women who have assimilated society's view that femininity and success are incompatible and that success is a positive goal. The woman's resulting ambivalence towards success inhibits performance in competitive achievement situations (2), especially when competing with men (6).

The motive to avoid success is assessed by a projective technique utilizing a thematic content analysis, as in the Thematic Apperception Test. The stories are written in response to verbal cues, such as the following: "After first term finals, Anne is at the top of her med school class." Any indication of negative consequences or negative affect as a result of success or withdrawal from success is scored as success-avoiding (2). Success-avoiding themes focus on social rejection by important "others" and on doubts about

* Received in the Editorial Office on October 12, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to acknowledge Drs. Harry P. Shelley and C. Blake Keasey for their critical review of the manuscript.

² The research was done while the senior author was at the University of Nebraska. Reprints are available from the senior author at the address shown at the end of this article.

femininity and self-adequacy. That is, while a theme without success-avoidance centers on self-satisfaction and realistic coping, the success-avoiding theme is characterized by self-doubt and emotional dependency.

A similar self-adequacy/inadequacy dichotomy has been described in Ivey and Bardwick's (4) work on affective fluctuations in the menstrual cycle. The data from their content analysis of free-association verbal samples (p. 341) demonstrated that a constantly recurring theme at ovulation was "... self-satisfaction over success or ability to cope with a situation." In contrast, the themes of premenstrual women were characterized by concern with close interpersonal relationships in general and "... feelings of helplessness." The parallelism in thematic content between success-avoiding stories and stories told by premenstrual women and between nonsuccess-avoiding stories and stories told by ovulating women suggested a relationship between the woman's menstrual cycle and the motive to avoid success.

Other researchers (1, 10) have found increased depression, anxiety, and feelings of low self-esteem during the premenstrual phase. Moos (7) found similar results and, in addition, found relatively high correlations between the extent and type of symptoms women experience in the menstrual, premenstrual, and intermenstrual phases. Moos concluded that specific types of negative affect that occur in the premenstrual phase are intensifications of symptoms that occur to a minor extent throughout the cycle. The findings of Patty and Shelley (8) demonstrate that women evidencing the motive to avoid success described themselves as lower in family and personal self-perceptions, thereby suggesting that the motive to avoid success is negatively related to the perception of self-adequacy. This association of the motive to avoid success and the lower self-perceptions, though, may be representative of negative affect present or exacerbated during premenstruation. It was therefore predicted that premenstrual women would write more motive-to-avoid-success stories than women who were intermenstrual. There being no empirical bases from which to hypothesize, no predictions were made concerning the incidence of the motive to avoid success among women who were menstruating.

B. METHOD

The sample studies consisted of two groups of college women recruited from the introductory psychology course at the University of Nebraska.

Following the alternative-form assessment of the motive to avoid success outlined by Patty and Shelley (8), subjects were given a short questionnaire

concerning their menstrual cycle. Specifically, they were asked to indicate, on a calendar, the dates of their last menstrual period and the date on which they expected to begin their next period. Subjects were asked not to guess if their cycle was too irregular or if they could not remember. In addition, in the second sample, they were asked to indicate if they were pregnant or using oral contraceptives.

Women who were menstruating at the time of assessment were classified as menstrual, women who were within six days of the predicted onset of menses were classified as premenstrual, women on the 7th or 8th day of the predicted onset of menses were eliminated from the sample, and women who were on any other day of their cycle were classified as intermenstrual. Because of the problem of inaccuracy in reporting their cycles and the individual differences between women's cycles, this simple three classification procedure was used. A day by day analysis is not justified (although preferable) by the methods employed. However, to differentiate definitively intermenstrual and premenstrual women, women on the seventh and eighth day from the predicted onset of menses were eliminated from the sample.

Seven subjects were dropped from the first sample because they could not accurately remember or predict the dates of their menstruation, and 33 were dropped from the second sample because of inaccuracy, pregnancy, or the use of oral contraceptives. These elimination procedures resulted in a total of 34 subjects in the first sample and 64 in the second.

C. RESULTS

The results of the first sample demonstrated that seven out of nine women who were premenstrual wrote success-avoiding stories, while only four out of 15 women who were intermenstrual wrote success-avoiding stories. This relationship was significant (Fisher's Exact Test, $p < .05$).

A replication with the second sample cross-validated the finding. That is, significantly more premenstrual women wrote success-avoiding stories than intermenstrual women ($\chi^2 = 12.55$, $df = 1$, $p < .001$). Of the 15 premenstrual women, 12 wrote motive-to-avoid-success stories, and three did not. In contrast, of the 33 intermenstrual women, only seven wrote motive-to-avoid-success stories, while 26 did not.

No predictions were made concerning the relationship of the motive to avoid success and menses, and the results suggest the lack of an association. Summing subjects in both samples, 14 menstrual women wrote success-avoiding stories and 13 did not.

D. DISCUSSION

The results suggest that the motive to avoid success is related to the menstrual cycle. In reviewing the literature, the most popular interpretation of the results would suggest that the excessive ambivalencies and conflicts present at premenstruation are an exacerbation of the same conflicts found throughout the cycle. The latent or minimal success-ambivalency, present intermenstrually, becomes engaged at premenstruation. During the premenstrual phase, when some women feel least self-assured and self-confident, perhaps as a reflection of changes in body chemistry (3), they may be most hesitant to defy the cultural norms that define femininity. Although they still value success, lowered self-confidence may heighten otherwise unexpressed ambivalency towards success.

An alternative interpretation suggests that all forms of premenstrual tension, including the motive to avoid success, are reflections of the woman's attitudes and expectancies about menstruation rather than a direct emotional reaction to hormonal changes. Many societies (including the most technologically advanced) view menstruation as unclean, at best an embarrassment. Women may assimilate this evaluation and come to view their menses, their bodies, and their "womanliness" in shame. Shainess (9) has found that a woman's negativity towards menses is correlated with menstrual dysfunction. Levitt and Lubin (5) found that menstrual complaints are related to an aversive attitude towards menstruation. However, other more subtle negative reactions to the menstrual cycle may be evident during premenstruation. In this light, the experience of the forthcoming onset of menstruation creates tension which heightens the woman's existing personal conflicts.

However, to maintain perspective, all women do not feel negatively towards menstruation, and some do not evidence premenstrual tension. Future study might profit from investigating the mechanisms by which these women defy cultural expectations. In addition, many women in this investigation could not delineate their cycle. Therefore, the samples in this study may represent a select group who are generally more reactive to their cycle.

This investigation and a review of the literature suggest a cluster of intercorrelations. That is, premenstrual women had lower self-perceptions and high success-avoidance, and success-avoiders had lower self-perceptions. It is not yet possible to discriminate the common source of variance. In addition, increases in the motive to avoid success have not been demonstrated to relate to achievement performance. Future research should follow women through a number of menstrual cycles, delineating fluctuations in blood and/

or urine chemistry, self-perceptions, the motive to avoid success, attitudes towards menstruation, and achievement performance.

REFERENCES

1. COPPEN, A., & KESSEL, N. Menstruation and personality. *Brit. J. Psychiat.*, 1963, **109**, 711-721.
2. HORNER, M. Sex differences in achievement motivation and performance in competitive and noncompetitive situations. Unpublished Doctoral dissertation, University of Michigan, Ann Arbor, 1968.
3. JANOWSKY, D. D., BERENS, S. C., & DAVIS, J. M. Correlations between mood, weight, and electrolytes during the menstrual cycle: A renin-angiotensin-aldosterone hypothesis of premenstrual tension. *Psychosomat. Med.*, 1973, **35**, 143-154.
4. IVEY, M., & BARDWICK, J. Patterns of affective fluctuation in the menstrual cycle. *Psychosomat. Med.*, 1968, **30**, 336-345.
5. LEVITT, E., & LUBIN, B. Some personality factors associated with menstrual complaints and menstrual attitude. *J. Psychosomat. Res.*, 1967, **11**, 267-270.
6. MAKOSKY, V. P. Fear of success, sex role orientation of the task, and competitive condition as variables affecting woman's performance in achievement-oriented situations. Paper presented at Midwestern Psychological Association, Cleveland, Ohio, 1972.
7. MOOS, R. The development of a menstrual distress questionnaire. *Psychosomat. Med.*, 1968, **30**, 853-867.
8. PATTY, R., & SHELLEY, H. Motive to avoid success: A profile. Submitted for publication.
9. SHAINESS, N. A re-evaluation of some aspects of femininity through a study of menstruation: A preliminary report. *Compr. Psychiat.*, 1961, **2**, 20-26.
10. SUTHERLAND, H., & STEWART, I. A critical analysis of the premenstrual syndrome. *Lancet*, 1965, **1**, 1180-1183.

Department of Psychology
Wake Forest University
Winston-Salem, North Carolina 27109

ABBREVIATIONS OF WORDS USED IN THE TITLES OF JOURNALS

(One-word titles are never abbreviated. The word "the" is not used, nor its equivalent in any other language. The word "of" or its equivalent in other languages is used only to discriminate what would otherwise be identical titles in different languages. The word "and" is always used, but indicated by "&" in the Roman alphabet. Only English words are indicated here, but the corresponding words in other languages should receive a corresponding abbreviation. All abbreviations and all one-word titles should be in italics.)

Abnormal	<i>Abn.</i>	Japanese	<i>Jap.</i>
Abstracts	<i>Abst.</i>	Journal	<i>J.</i>
American	<i>Amer.</i>	Mathematical	<i>Math.</i>
Anatomy	<i>Anat.</i>	Measurement	<i>Meas.</i>
Animal	<i>Anim.</i>	Medical	<i>Med.</i>
Applied	<i>Appl.</i>	Mental	<i>Ment.</i>
Archives	<i>Arch.</i>	Monographs	<i>Monog.</i>
Association	<i>Assoc.</i>	Neurology	<i>Neurol.</i>
Attitude	<i>Attit.</i>	Opinion	<i>Opin.</i>
Australian	<i>Aust.</i>	Orthopsychiatry	<i>Orthopsychiat.</i>
Behavior	<i>Behav.</i>	Personality	<i>Personal.</i>
British	<i>Brit.</i>	Personnel	<i>Person.</i>
Bulletin	<i>Bull.</i>	Philosophy	<i>Philos.</i>
Bureau	<i>Bur.</i>	Physics	<i>Phys.</i>
Canadian	<i>Can.</i>	Physiology	<i>Physiol.</i>
Character	<i>Charac.</i>	Proceedings	<i>Proc.</i>
Children	<i>Child.</i>	Psychiatry	<i>Psychiat.</i>
Chinese	<i>Chin.</i>	Psychoanalysis	<i>Psychoanal.</i>
Clinical	<i>Clin.</i>	Psychology	<i>Psychol.</i>
College	<i>Coll.</i>	Psychosomatic	<i>Psychosomat.</i>
Comparative	<i>Comp.</i>	Quarterly	<i>Quart.</i>
Consulting	<i>Consult.</i>	Religious	<i>Relig.</i>
Contributions	<i>Contrib.</i>	Research	<i>Res.</i>
Development	<i>Devel.</i>	Review	<i>Rev.</i>
Educational	<i>Educ.</i>	School	<i>Sch.</i>
Experimental	<i>Exper.</i>	Science	<i>Sci.</i>
General	<i>Gen.</i>	Social	<i>Soc.</i>
Genetic	<i>Genet.</i>	Statistics	<i>Stat.</i>
Indian	<i>Ind.</i>	Studies	<i>Stud.</i>
Industrial	<i>Indus.</i>	Teacher	<i>Teach.</i>
International	<i>Internat.</i>	University	<i>Univ.</i>
Italian	<i>Ital.</i>		

Preparation of Manuscripts for The Journal Press

GENERAL INSTRUCTIONS

1. The proper sequence for the parts of your submitted manuscript is as follows: (a) references, (c) footnotes, (d) tables, (e) figures, and (f) figure legends. However, monographs start with a table of contents and may have an acknowledgment page before the text and an appendix immediately after the text.
2. Use heavy typewriter paper, $8\frac{1}{2} \times 11$ inches, double-space all lines, and leave margins for editorial work. Do not use onionskin, odd sizes, and abrasive or wax finishes.
3. Submit original typewritten version and one copy. Retain second copy for proofing.
4. Retype any page on which written corrections have been made.
5. Do not begin a sentence with a numeral.
6. A summary at the beginning of the text is required for articles over 500 words.
7. Each quotation should indicate the page number of the original source. The original publisher must give permission for lengthy quotations and use of tables or figures.
8. Do not fold your manuscript.
9. Enclose a submission letter, with a statement that the manuscript is not under consideration elsewhere. If you are unknown to the Editors, kindly give your credentials.

FORMAT AND SPECIFIC INSTRUCTIONS

A. TEXT DIVISIONS

I. THE TITLES OF JOURNAL ARTICLES AND THE MAJOR SUBDIVISIONS OF MONOGRAPHS ARE PRINTED IN TEN-POINT CAPS CENTERED ON THE PAGE

THE NEXT SUBDIVISION TITLE IS PRINTED IN CAPS AND SMALL CAPS CENTERED ON THE PAGE

1. *Then Italics, with Principal Words, Upper and Lower Case, Centered on the Page*

a. *Then italics, upper and lower case, 1-em run-in side head.*

(1). *Then italics, upper and lower case, 2-em run-in side head.*

(a). *Then italics, upper and lower case, 3-em run-in side head.*

[Further subdivision should be merged into the text without marginal indentation, and should be numbered with small letters.]

B. REFERENCES

References should be arranged in alphabetical order by author, numbered and referred to in the text by number (2). Double-space!

The proper form of a book reference is as follows:

2. DOE, J. The Preparation of Manuscripts. New York: Holt, 1963. Pp. 400-418.

The proper form of a journal reference is as follows:

2. DOE, J. The preparation of manuscripts. *J. Gen. Psychol.*, 1963, **68**, 450-462.

If in the text it is desirable to refer to a page, thus (2, p. 45).

C. FOOTNOTES

Use as few as possible and number consecutively in the text thus.¹

¹ Footnote (on the separate footnote page). Double-space!

D. TABLES

Each table should be typed on a separate sheet and should be Arabic numbered (Table 2). Each column requires a heading. Vertical lines should be avoided. Mention tables consecutively in the text and indicate approximate insertion points.

E. FIGURES

Figures should be submitted as glossy prints of the approximate size for final reproduction (ordinarily $4-4\frac{1}{2}$ inches in width). Lettering and lines should be sharp and clean. Figures should be Arabic numbered (Figure 2) in the text, and have consecutive mention and approximate insertion points. Each figure requires a legend, but all legends should be submitted spaced on a separate Figure Legends page.

Don't forget to check the library

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

March, 1974
Volume 86, Second Half

Founded in 1935 by Carl Murchison

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

ARTHUR G. BILLS
University of Cincinnati

E. A. BOTT
University of Toronto

LEONARD CARMICHAEL
National Geographic Society

IRVIN L. CHILD
Yale University

HERBERT S. CONRAD
U. S. Office of Education

JOHN F. DASHIELL
Florida State University

LEONARD W. DOOB
Yale University

If this space be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special

edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

FRANK R. GELDARD
Princeton University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

DAVID HOTHERSALL
Ohio State University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

WARREN H. TEICHNER
New Mexico State
University

LEE EDWARD TRAVIS
Fuller Theological
Seminary

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass.
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02657

Microfiche Now Available

Back Issues

While continuing to maintain a complete inventory of paper-bound back issues for all five journals—some reprinted and some original editions—The Journal Press is now offering microfiche (negative silverfiche) versions for all but the last two calendar years: i.e., Volume 1 through 1970 volumes are available immediately; 1971 volumes will first be available in January 1974; 1972 volumes, in January 1975, etc. The minimum order is for one volume. The following rates are in effect: Paper-bound—single numbers, \$9.00; microfiche, not available. Paper-bound—two-part volumes, \$18.00; microfiche, \$6.00. Paper-bound—three-part volumes, \$27.00; microfiche, \$9.00. Paper-bound—four-part and over-four-part volumes, \$36.00; microfiche, \$12.00. The only exceptions (special issues) are starred below.*

VOLUMES	DATES	PRICE PER VOLUME		PRICE THROUGH 1970	
		PAPER	MICRO-FICHE	PAPER	MICRO-FICHE
<i>Journal of Genetic Psychology</i> (Pedagogical Seminary)					
1-117	1891-1970				
1-4	1891-April 1897			\$2754.00	\$895.00
5-37	July 1897-1930	\$27.00	\$ 9.00		
38*	1930	36.00	12.00		
39	1931	18.00	6.00		
40 and later	1932-	36.00	12.00		
		18.00	6.00		
<i>Genetic Psychology Monographs</i>					
1-82	1926-1970				
1-22	1926-1940			1872.00	620.00
23 and later	1941-	36.00	12.00		
		18.00	6.00		
<i>Journal of General Psychology</i>					
1-83	1928-1970				
1-3	1928-1930			1566.00	520.00
4*	1930	36.00	12.00		
5	1931	18.00	6.00		
6 and later	1932-	36.00	12.00		
		18.00	6.00		
<i>Journal of Social Psychology</i>					
1-82	1930-1970				
1-10	1930-1939			1656.00	550.00
11 and later	1940-	36.00	12.00		
		18.00	6.00		
<i>Journal of Psychology</i>					
1-76	1935/36-1970				
1 and later	1935/36-	18.00	6.00	1368.00	450.00

A mailing charge of \$0.30 per volume is made for foreign delivery of paper editions. Domestic paper mailings carry no postage charge. Prepaid foreign and domestic microfiche orders are also postage free; other orders will be billed for costs. Remittances should be by check or money order payable in U.S. funds on a United States bank, with no bank commission deducted. Advance payment is required from all individuals and from foreign purchasers. Microfilm versions and special bindings are not available. Microfiche orders only may be sent directly to The Journal Press or to Johnson Associates Inc., 175 Fifth Avenue, New York, New York 10010.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Notice: All copyrighted material reprinted or otherwise reproduced from Journal Press publications should be given an appropriate acknowledgment. No permission is necessary for brief quotations and originally worded abstracts (less than 300-word total or 10 percent of length, whichever is least, for any one article). Written permission is required for reprinting or copying tables, figures, summaries, entire articles, or substantial portions thereof; such permission normally carries a charge of \$5 per page and is contingent upon agreement and possible stipulation of the original author or authors. Estate permission can be required. Authors requesting use of their own material are not charged. Fees may be waived for limited-copy instructional usage and for government periodicals. Special rates can be applied when justified.

The Journal of Psychology

Founded in 1935 by Carl Murchison

The Journal of Psychology was founded at the request of many psychologists throughout the world for the purpose of establishing a medium in which publication shall be immediate and in which other publication experiments may be carried out.

(1). The subscription price is \$39.00 per annum, \$18.00 per volume, \$9.00 per issue (three volumes per year).

(2). Manuscripts may be sent to any member of the Editorial Board or may be sent directly to The Journal Press. The lag in publication should not be more than a few weeks.

(3). The author will receive 200 reprints of his paper, and subscribers will receive the accumulated publications bound into half-volume units. The second half of each volume will contain the title page and table of contents for that volume. Each half-volume unit will be mailed to the subscribers at its stated date.

(4). Each author will be charged the manufacturing costs of any zincs, halftone cuts, tables, or equations. Excessive use of special fonts (references, footnotes, quotations, appendices) will also be charged.

(5). The publication charges are as follows:

1 to 4 pages	\$60.00
5 to 8 "	120.00
9 to 12 "	180.00
13 to 16 "	240.00
17 to 20 "	300.00
21 to 24 "	360.00
25 to 28 "	420.00
29 to 32 "	480.00

These charges are subject to adjustment as justified.

(6). The accumulated units will be mailed to subscribers bimonthly: January, March, May, July, September, and November. The units may vary in size to accommodate publication needs.

All back issues are available. See announcement on inside front cover.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Diary No. 780
Date 19.7.74

Journal of Genetic Psychology

Founded by G. Stanley Hall in 1891; reorganized by Carl Murchison in 1925

Quarterly, beginning with March. Devoted to developmental and clinical psychology, with briefly reported Replications and Refinements and occasional book reviews. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of General Psychology

Founded in 1927 by E. B. Titchener and Carl Murchison

Quarterly, beginning with January. Devoted to experimental, physiological, and comparative psychology, with briefly reported Replications, Refinements, and Comments. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of Social Psychology

Founded in 1929 by John Dewey and Carl Murchison

Bimonthly, beginning with February. Devoted to studies of persons in group settings and of culture and personality; special attention to cross-cultural articles and notes, to field research, and to briefly reported Replications and Refinements. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Three volumes annually. Per annum, \$39.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Each author will receive 100 unbound reprints gratis. Additional reprints may be purchased at a nominal cost when the author returns page-proof.

THE JOURNAL PRESS

2 Commercial Street

Provincetown, Massachusetts 02657

U. S. A.

Club Rate for Five International Psychological Journals

	PER ANNUM
THE JOURNAL OF GENETIC PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
GENETIC PSYCHOLOGY MONOGRAPHS (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF GENERAL PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF SOCIAL PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
THE JOURNAL OF PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
	<u>TOTAL \$156.00</u>

TEACHERS AND STUDENTS EDITION, *Restricted Sale* \$50.00

The *Teachers and Students Edition* is open to any individual psychologist, teacher, student, or physician but requires an agreement that the edition will not be offered for sale till after five years from publication and an agreement that the edition will not be substituted for an institutional subscription. Write for our Teachers and Students contract card.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Genetic Psychology Monographs

Founded in 1925 by Carl Murchison

Quarterly, beginning with February. Devoted to developmental and clinical psychology. Each number one or more complete researches. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

NOTICE. Effective immediately we offer prior publication for certain selected monographs. Charges will be based on the announced rates for The Journal of Psychology. Regular monographs will carry no page charge for the first 50 pages, but for all pages above 50 there will be a charge of \$10.00 per page. Manufacturing costs of any zincs, halftone cuts, tables, or equations will be charged to authors, as will excessive use of special fonts. Two hundred reprints of each monograph will be supplied free of charge.

The listing of monographs for 1926 through 1963 will be printed in the first half of each volume of all five journals. Monographs published after 1963 will be listed in the second half of each volume.

Genetic Psychology Monographs (continued)

VOLUME 69—January-June, 1964

- Occupational and industrial therapy in the treatment of psychiatric patients: A controlled study of efficacy in an intensive-treatment institution—M. HUNDZIAK AND B. PASAMANICK
An analysis of Carl R. Rogers' theory of personality—M. S. KRAUSE
Personality aspects of teaching: A predictive study—H. ZIMILES, B. BIBER, W. RABINOWITZ, AND L. HAY
- Age changes in children's Mosaic responses from five to ten years—L. B. AMES AND F. L. ILC
A study of the interview process: The caseworker-client relationship—H. J. MEYER, E. F. BORGATTA, AND D. FANSHER
A study of introversion-extroversion as a personality dimension—R. M. ALLEN, H. M. RICHER, AND R. J. PLOTNIK
Psychological testing with Northwest Coast Alaskan Eskimos—C. E. PRESTON
A study in family pathology—M. B. HANS

VOLUME 70—July-December, 1964

- Structure and function—H. CUTMAN
The Lowenfeld Mosaic Test: Norms for five-to-ten-year-old American public-school children and comparative study of three groups—L. B. AMES, F. L. ILC, AND J. AUGUST
Social and personality correlates of children's estimates of height—J. P. SHAFFER
The development of ethnic attitudes in New Zealand school children—G. M. VAUGHAN
- The antecedents of two varieties of vocational interests—L. E. TYLER
Personality in old age—P. E. SLATER AND H. A. SCARR
Variables affecting experimenter bias in a group situation—R. ROSENTHAL, C. J. FRIEDMAN, C. A. JOHNSON, K. FORD
T. SCHILL, R. C. WHITE, AND L. L. VIKAN
Ordinal position and sex role identification—B. G. ROSENBERG AND B. SUTTON-SMITH
Personality correlates of accuracy of self-appraisal in four-year-old children—PAUL S. WEINER

VOLUME 71—January-June, 1965

- Author index for Genetic Psychology Monographs 1926-1964—L. W. FERGUSON
A theoretical, developmental, and clinical investigation of embarrassment—J. M. SATTLER
School readiness as evaluated by Gesell developmental, visual, and projective tests—F. L. ILC, L. B. AMES, AND R. J. APELL
Rorschach scales of regression in psychosis—S. NEIGER, A. G. SLEMON, AND D. A. QUIRK
The effects of extra tactile stimulation on a group of institutionalized infants—L. CASLER
Human-eyelid conditioning: The recent experimental literature—L. E. ROSS AND T. F. HARTMAN
- Social status and schoolroom aggression in third-grade children—R. TOIGO
Overt and covert homosexual problems among male college students—L. J. BRAATEN AND C. D. DARLING
Role conceptions of the psychiatric aid—M. P. LAWTON AND A. E. GOLDMAN
Changes in study of values scores during the four years of college—C. W. HUNTLEY

VOLUME 72—July-December, 1965

- A study of process and method in three-year-old twins and triplets learning to read—W. FOWLER
Individualized teaching with therapeutic aims: A methodological study—M. KOHN AND M. RUDNICK
Ability and social adjustment at midlife of persons earlier judged mentally deficient—E. L. MILLER
Development of incentive values in childhood—S. L. WITVOLD, D. J. TYRRELL, AND L. M. LOWDEN
Longitudinal changes in intolerance and authoritarianism for subjects differing in amount of college education over four years—W. T. PLANT
An NDEA counseling and guidance institute: Prediction, performance, and follow-up—R. H. DANA
The influence of language on classification: A theoretical model applied to normal, retarded, and deaf children—H. G. FURTH AND N. A. MILGRAM
Time estimates as affected by incentive class and motivational level—M. FELIX
Clinical psychology: An historical survey—V. S. SEXTON

VOLUME 73—January-June, 1966

- Vulnerability in infants and young children: A pilot study—G. HEIDER
AND D. A. MCPHERSON
Racial preference and ego-identity among white and Bantu children in the Republic of South Africa—A. J. GREGOR
Mother-child interaction in cerebral palsy: Environmental and psychosocial obstacles to cognitive development—E. SHERE AND R. KASTENBAUM
Children's stories—L. B. AMES

VOLUME 74—July-December, 1966

- Changes in personality for groups completing different amounts of college over two years—W. T. PLANT AND C. W. TELFORD
Brain dynamism in perception of reversible figures—G. K. YACORZYNSKI
Changes in Rorschach response throughout the human life span—L. B. AMES
Mnemonic virtuosity: A study of chess players—A. BINET (Translated by M. L. SIMMEL AND S. B. BARRON)
The development of behavior patterns in children—B. B. TYLER, F. B. TYLER AND J. E. RAFFERTY
Correlates of classroom functioning—L. M. SMITH AND B. B. HUDGINS
Children's behavior syndromes and parental responses—R. L. JENKINS, E. NUREDDIN, AND I. SHAPIRO

VOLUME 75—January-June, 1967

- Studies of an elementary game of strategy—B. SUTTON-SMITH AND J. M. ROBERTS
Child care practices anteceding three patterns of preschool behavior—D. BAUMRIND
The impact of cognitive maturity on the development of sex-role attitudes in the years 4 to 8—L. KOHLBERG AND E. ZIGLER
Differential factor structures in mathematical ability—P. S. VERY
Perception of the vertical as a function of affective stimuli and extraneous stimulation in schizophrenic and normal subjects—J. O. WELLS AND W. E. CALDWELL
Mid-life attainment of the mentally retarded: A longitudinal study—W. R. BALLER, D. C. CHARLES, AND E. L. MILLER

VOLUME 76—July-December, 1967

- Scalogram analysis of some developmental sequences of infant behavior as measured by the Bayley Infant Scale of Mental Development—R. KOHEN-RAZ
The leader and the lost: A case study of indigenous leadership in a poverty program community action committee—L. A. ZURCHER
A developmental study of the perception of people—R. N. WOLMAN
Human fears: A factor analytic study of three age levels—C. W. RUSSELL
Correlates of voluntary social participation—J. E. TEELE
Personality characteristics and developmental history of creative college women—R. HESLON
A systematic study of therapeutic interventions in nursing homes—B. A. STOTSKY

VOLUME 77—January-June, 1968

- The fulfillment of promise: 40-year follow-up of the Terman Gifted Group—M. H. ODEN
A scale for parents' ratings: Some ipsative and normative correlations—R. N. WALKER
A methodological investigation of Piaget's concept of conservation of substance—A. C. BITTNER AND M. M. SHINEDLING
Sex differences in mental and behavioral traits—J. E. GARAI AND A. SCHEINFELD

Genetic Psychology Monographs (continued)

VOLUME 78—July-December, 1968

1. A theoretical and developmental investigation of delayed speech feedback—J. E. WATERS
Growth changes in factorial structure by age and sex—N. W. DYE AND P. S. VERY
A multispect investigation of masculine development in kindergarten age boys—H. B. BILLER
2. The optimum limits of testing on the Wechsler Intelligence Scales—M. Y. QUERESHI
A developmental study of the ego-ideal—L. VAN DEN DAEL
The relationship between physical condition immediately after birth and mental and motor performance at age four—N. EDWARDS

VOLUME 79—January-June, 1969

1. Adolescents: From the views of the members of an informal adolescent group—T. P. JOSEPH
Acculturation and childhood accidents among Chinese and Japanese Americans—M. KUROKAWA
2. Dimensions of achievement-related behavior among lower-class Negro parents—D. SOLOMON, R. J. PARELIUS, AND T. V. BUSSE
Dimensions in the judgment of illness—J. S. KERRICK
Reversal shifts and problem-solving abilities at ages 4-7—S. B. KASTNER
The judgment of body landmark heights—H. NASH
Recognition of body surface regions—H. NASH

VOLUME 80—July-December, 1969

1. Animal aggression: Review of research—W. M. VERNON
The effects of positive and negative reinforcement and test anxiety on the reading performance of male elementary school children—S. COTLER
Personality and psychosomatic illness: A selective review of research—P. R. ROBBINS
Task and motivational influences on the assessment of creative and intellectual ability in children—N. KOCAN AND F. T. MORGAN
A study of an interview method for identifying family authority patterns—R. W. CHAMBERLIN
2. Conditioned reinforcing and aversive aspects of the stimuli defining the components of a two-component chain—A. KAUFMAN AND A. BARON
The Henry Hilteson Center Family Interaction Scales—M. L. BEHRENS, D. I. MEYERS, W. GOLDFARB, N. GOLDFARB AND N. D. FIELDSTEEL

VOLUME 81—January-June, 1970

1. Attitudes of college students and their changes: A 37-year study—V. JONES
Tattooing among male and female offenders of different ages in different types of institutions—A. J. W. TAYLOR
2. Sex differences in mental health—J. E. GARAI
A selective review of dominance-subordination relations in animals—D. VAN KREVELD
The effects of visual or auditory stimulation given in infancy upon subsequent preference for stimulation of both modalities—W. R. BERKOWITZ
The influence of certain child-rearing factors upon the development of a structured and salient sense of time—D. ZELTZER

VOLUME 82—July-December, 1970

1. Child care attitudes and emotional disturbance among mothers of young children—B. J. COHLER, J. L. WEISS, AND H. U. GRUNBAUM
A study of intragroup and intergroup relations among experimentally produced small groups—L. N. DIAB
The development of role knowledge—D. R. HEISE AND E. P. M. ROBERTS
2. Midlife: Age related stress periods during adult years—J. E. HORROCKS AND M. C. MUSSMAN
The first six years of life: A report of current research and educational practice—E. LACROSSE, P. C. LEE (ED.), F. LITMAN, D. M. OGILVIE, S. S. STODOLSKY, AND B. L. WHITE

VOLUME 83—January-June, 1971

1. Measurement of parents' perceptions of their children's development—W. WOLFENBERGER AND R. A. KURTZ
The concomitant development of cognitive and moral modes of thought: A test of selected deductions from Piaget's theory—L. C. LEE
Children's influences upon parental behavior: An attempt to define the relationship with the use of laboratory tasks—J. D. OSOFSKY
2. Parent behavior and child academic achievement, achievement striving, and related personality characteristics—D. SOLOMON, K. A. HOULIHAN, T. V. BUSSE, AND R. J. PARELIUS
Memory factors and school success of average and special groups of ninth-grade boys—M. MEEKER AND C. E. MEYER
Personality correlates of vocational planning—R. BARNETT

VOLUME 84—July-December, 1971

1. Perceptual distortion as a function of stimulus objects, sex, naiveté, and trials using a portable model of the Ames Distorted Room—T. A. GERACE AND W. E. CALDWELL
Galvanotactic behavior and reinforcement of fish *Brachydanio rerio*—W. F. FLANIGAN, JR., AND W. E. CALDWELL
Self-actualization, types of personality, and neuroses and psychoses—R. DREISTADT
Children's awareness of their bodily appearance: A developmental study of factors associated with the body perception—E. GELLERT, J. S. GIGUS, AND J. COHEN
2. Biometric phenomena: Some implications for the behavioral and neurophysiological sciences—F. RUSSO AND W. CALDWELL
Sociometric task leadership and the perception of deviance and subsequent conformity as functions of personality—W. L. LIBBY, JR.
Murderers who plead insanity: A descriptive factor analytic study of personality, social, and history variables—M. KAHN

VOLUME 85—January-June, 1972

1. Children's understanding of negation as a logical operation—S. S. FELDMAN
Selective auditory perception of parental voices by the disturbed child—S. SANDERS
Identity type, sociometric ratings, and group behavior—C. N. ZIMET AND C. SCHNEIDER
Patterns of perceived reaction to frustration among adolescents—J. O. PALMER
2. The need for influence: Development and validation of a measure, and comparison with the need for power—J. S. ULEMAN
C. Lloyd Morgan, E. C. Tolman, and comparative method—E. NEWBURY
Relearning motor skills in hemiplegia: Error analysis—L. DILLER, J. BUXBAUM, AND S. CHIOTELIS
Effects of participation in rule formation on the moral judgment of children—R. L. MERCHANT AND F. REBELSKY
Discrepancy and attention in the five-month infant—C. M. SUPER, J. KAGAN, F. J. MORRISON, M. M. HAITH, AND J. WEIFFENBACH

Genetic Psychology Monographs (continued)

VOLUME 86—July-December, 1972

- The role of enduring orientations to the environment in personality development—W. C. BRONSON
 Is there an error of the standard? A critique of Piaget's perceptual theory—D. A. BEGELMAN AND G. J. STEINFELD
 A cross-cultural study of the relationship between resistance to temptation and maternal communication—E. R. GREENGLASS
 The intellectual and achievement effects of preschool cognitive stimulation of poverty Mexican-American children—W. T. PLANT AND M. L. SOUTHERN
 Factors affecting agnostic behavior in several subhuman species—R. F. GOTTIER
 Differential behavioral characteristics of nonpromoted children—J. A. CHASE
 An analysis of cognitive-developmental sequences—J. H. FLAVELL

VOLUME 87—January-June, 1973

- A survey and interpretation of article characteristics: *The Journal of Genetic Psychology* 1945-1969—J. E. HORROCKS
 AND J. D. HOGAN
 The development of listener adapted communications in grade-school children from different social-class backgrounds—K. T. ALVY
 Locus of control among schizophrenics and other hospitalized psychiatric patients—T. F. CASH AND J. J. STACK
 Interactive styles and social adaptation—C. N. EDWARDS
 The motivation of exploration strategies in young children—J. D. COLE
 Children's representation of the human figure: The effects of models, media, and instructions—C. COLOMBE
 A perceptual program for classroom teachers: Some results—R. N. WALKER AND J. STREFF
 Behavioral approaches to study and treatment of psychogenic tics—M. HERSEN AND R. M. EISLER
 Patterns of intellectual development during childhood and adolescence—M. Y. QUERESHI

VOLUME 88—July-December, 1973

- Adolescent marginality—A further study—J. H. BAMBER
 Psychological problems of abortion for the unwed teenage girl—C. D. MARTIN
 Perceptual preferences in relation to aspects of personality—L. M. GOODMAN
 An exploratory study of personality manifestations in paintings—R. B. BURT
 A developmental study of cognitive dissonance as a function of level of intellectual performance on Piagetian tasks—A. BACCIO, G. A. WEGNER, AND S. C. SIMPSON
 The validity of parent-child socialization measures: A comparison of the use of assumed and real parent-child similarity with criterion variables—G. COUNT-VAN MANEN
 Racial preference and identification of black, American Chinese, and white children—D. J. FOX AND V. B. JORDAN
 Obsessional neurosis: Etiology and biopsychological presuppositions. A comparative study involving Freudian and Piagetian theory—R. PIVETTA
 Dimensions of competence in young children—F. ALI
 Differentiating children's symptom checklist items on the basis of judged severity of psychopathology—E. E. LESSING, H. BEISER, M. KRAUSE, P. DOLINKO, AND S. W. ZAGORIN

VOLUME 89—January-June, 1974

- Transgression as a function of timing of punishment and age—T. A. CHANDLER
 Perception of vocal expression of emotion by hospital staff and patients—H. NASH
 Development of geometric imagery in five- to eight-year-olds—C. J. BRAINERD AND K. VANDEN HEUVEL
 Modern logic and schizophrenic thinking—D. Y. F. HO

THE JOURNAL PRESS
 2 Commercial Street
 Provincetown, Massachusetts 02657
 U. S. A.

PUBLICATION IN THE JOURNAL OF PSYCHOLOGY

The Journal of Psychology provides a special service to authors and readers. Articles accepted for publication appear in print with the least possible delay. Although editorial standards are the same as those for the other journals, all correspondence and handling are expedited, and the referees may, at their discretion, permit some latitude in length of treatment with respect to tabular material, discussion, and review of the literature.

To save time, authors are requested to exercise unusual care in preparing their papers. Special attention should be paid to the General Instructions on the back cover of each issue and to the announcement on the first preliminary page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

March, 1974
Volume 86, Second Half

(Founded in 1935 by Carl Murchison)

The Journal of PSYCHOLOGY

The General Field of Psychology

If this space should be unstamped, this is the regular library edition. But if this space is stamped with a designating title, this is a special edition, sold under the

restrictions of a bilateral contract, and may not be resold for a period of five years from the date of publication.

MARCH, 1974

(Manuscripts are printed in the order of final acceptance)

Women's fear of success in relation to personal characteristics and type of occupation	181
BY CAROLYN J. BREEDLOVE AND VICTOR G. CICIRELLI	
Teacher characteristics associated with student classroom behaviors	191
BY LAWRENCE C. HARTLAGE AND JUDITH SCHLAGEL	
Personality and innovative buying behavior	197
BY LOUIS E. BOONE	
Perceiver sex and expressor sex as related to cognitive perception	203
BY BILL C. EDWARDS AND JETTIE M. MCWILLIAMS	
Altruism as a function of response cost to the benefactor	209
BY ROBERT M. TIPTON AND LARRY JENKINS	

(OVER)

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 01902

Attitude-behavior consistency as a function of generality equivalence between attitude and behavior objects	217
BY ALLEN E. LISK	
Cognitive structure and performance on classroom material	229
BY FRANZ R. EPTING, DAVID I. SUCHMAN, AND ANN HOWLAND	
Judged seriousness of Watergate-related crimes	235
BY ROBERT M. CARROLL, STEVEN M. PINE, CINDY J. CLINE, AND BRUCE R. KLEINHANS	
Response bias in the state-trait anxiety inventory: Detecting the exaggeration of stress	241
BY ROGER C. SMITH	
Student raters' referents in rating college teaching effectiveness	247
BY JOHN FOLLMAN, CAROLYN LAVELY, STUART SILVERMAN, AND JOHN MERICA	
The effect of increasing reading rate on comprehension	251
BY HOWARD C. HIMELSTEIN AND GARY GREENBERG	
A comparison of reasoning skills and moral judgments in delinquent, retarded, and normal adolescent girls	261
BY CHARLES K. MILLER, LARRY ZUMOFF, AND BETH STEPHENS	
Elimination of subtraction errors by contingent self-correction in retarded children	269
BY PAUL M. SMEETS AND SEBASTIAN STRIEFEL	
The determination of locus of control in a geriatric population and a subsequent test of the social learning model for interpersonal distances	277
BY MARSHALL P. DUKE, JOYCE SHAHEEN, AND STEPHEN NOWICKI, JR.	
Interpersonal comparison processes in choice dilemma responding	287
BY DAVID G. MYERS	
Some developmental characteristics of schematic concept formation	293
BY ED M. EDMONDS	
Alienation as measured by three different instruments	297
BY ALEXANDER TOLOR	
Reactions of preadolescent girls to science tasks	303
BY PATRICIA BRUCE	
A note on weight discrepancy and humor	309
BY LAMBERT DECKERS AND PHILIP KIZER	
The analysis and resolution of international disputes	313
BY LEONARD W. DOOB	
Response set analysis of Mother's form of Parental Attitude Research Instrument (PARI)	327
BY SHIRIN SCHLUDERMANN AND EDUARD SCHLUDERMANN	
Rated effectiveness of antidrug letters by drug users and nonusers	335
BY MARY JO CONTE AND LEONARD W. FERGUSON	
Forced deviation, conformity, and commitment	341
BY GERALD T. SLATIN	

WOMEN'S FEAR OF SUCCESS IN RELATION TO PERSONAL CHARACTERISTICS AND TYPE OF OCCUPATION*¹

Purdue University

CAROLYN J. BREEDLOVE AND VICTOR G. CICIRELLI²

SUMMARY

One hundred college women completed a situational story that dealt with a traditional feminine occupation, while another 100 women completed a story that dealt with a more nontraditional, masculine occupation. The stories were used to measure fear of success. All women furnished information on their college major, career aspirations, and year in school, and completed the Masculinity and Ascendency scales from the Guilford-Zimmerman Temperament Survey. Both two- and three-dimensional chi square tests of association were performed to determine the relationship between fear of success and other variables.

Results ($p < .05$) indicated that fear of success is greater toward a nontraditional occupation, especially for women of low ascendency, and fear of success is greater the closer women get to graduation.

A. INTRODUCTION

Women's role, obviously, is a source of confusion and anxiety, especially for the bright woman. If she succeeds in the traditional feminine role, she may have to reject any hopes of intellectual attainment. If she chooses, on the other hand, to stress her intellectual achievement, she risks the chance of being seen as a feminine failure to society in general. According to Maccoby (15), a girl who maintains qualities of dominance, independence, and active striving needed for analytic thinking is defying conventions of sex-appropriate behavior. Mead and Kaplan (16) pointed out that a woman who is successful in a "man's" career is made to feel unfeminine and is termed "aggressive, brash, and pushy." The conflict between a woman's personal life and her career, between society's traditional expectations and

* Received in the Editorial Office on October 15, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This article is based on a thesis submitted to Purdue University by the first author in partial fulfillment of the Master's degree.

² Requests for reprints should be sent to the second author at the address shown at the end of this article.

her own need for personal fulfillment and identity, has been lamented by many writers and researchers (1, 7, 9, 18, 19).

Horner (12, 13) studied college students and found that women's desire to achieve in academic and occupational activities is often detrimentally influenced by what she called the "motive to avoid success." She defined this motive as "the fear that success in competitive achievement situations will lead to negative consequences such as unpopularity and loss of femininity." She postulated that "when fear of success conflicts with a desire to be successful, the result is inhibition of achievement motivation" (13, p. 38). Horner asked male students to complete a story based on the single clue: "After first-term finals, John finds himself at the top of his medical school class"; female students were given the same clue but with the name "Anne" instead of "John." In analyzing the stories in a manner analogous to TAT scoring, Horner found that 65% of the girls showed a fear of success by writing stories that generally indicated a strong fear of social rejection as a result of success, worry over the definitions of womanhood, or complete denial of the possibility that such a situation could exist for a woman. Fewer than 10% of the boys in the sample, however, showed any evidence of the motive to avoid success. In addition, Horner found that the girls in her sample who feared success generally had high intellectual ability and histories of academic success. The vast majority, however, were majoring in humanities and in spite of their high grade point averages were aspiring to traditional female careers. Those girls who did not fear success, on the other hand, were aspiring to graduate degrees and careers in more "masculine," nontraditional occupations.

The present study is an attempt to answer the question of whether fear of success in women occurs in relation to the prospect of succeeding in traditionally feminine occupations or whether it is aroused mainly by the sanctions against competition in masculine occupations. If the fear of success is largely composed of fears of rejection and power struggles with men within the masculine field (19), then one would expect to find less fear in regard to entering a feminine field. If, on the other hand, the fear of success is largely composed of fears of general social disapproval at relinquishing the traditional female roles of wife and mother, then one would expect to find fear of success in regard to entering any field, masculine or feminine.

Women who are intellectually independent in later years have been found to be more competitive, aggressive, self-assertive, independent, and dominant in their early school years (14, 15, 21). Connell and Johnson (3)

found that even into early adolescence, females may be positively reinforced for adopting certain male role characteristics. Such work would suggest that women who manifest a more masculine set of personality traits would also show less fear of success.

The conflict between desire to achieve and feminine affiliative needs (2, 20) begins at puberty and increases with nearness in time of actually being able to participate in the adult feminine sex role; such a view suggests that fear of success becomes greater as college women approach graduation and actual participation in a career.

This study therefore investigated the relationship of fear of success in masculine and feminine occupations to such variables as women's masculinity and ascendancy scores, their year in college, and their choice of college major and career aspirations.

B. METHOD

1. Subjects

The subjects were 200 white college women living in a coeducational residence hall at Purdue University. All females living in the hall who volunteered were accepted with the exception of seniors graduating at the end of semester. It was felt that their concurrent search for employment might influence their responses to the questionnaire.

2. Procedure

The subjects were equally divided into two groups, one group of 100 receiving a medical school questionnaire and the other receiving an education questionnaire. The subjects were asked to come to a conference room in the residence hall at their convenience over a three day period to complete the questionnaire. Nine subjects were eliminated from the study and were replaced because they completed only part of the questionnaire.

3. Measures

The questionnaire completed by each woman consisted of a measure of the motive to avoid success, questions regarding field of study and career aspirations, and measures of ascendancy and masculinity.

a. *Motive to avoid success.* With use of Horner's method, the subjects in the "medical school" group were asked to complete a story based on the clue, "Anne just received here semester grades and found that she is ranked first in her class in medical school," and the subjects in the "education"

group were asked to complete a story based on the clue, "Anne just received her semester grades and found she is ranked first in her class in graduate elementary education."

Elementary education was chosen as the typical feminine occupation because of the large number of degrees granted to women in education. The term "graduate" was added to equate number of years in school with the medical school group. The women were asked to complete the story before going on to the rest of the questionnaire.

Using Horner's scoring method, two raters independently placed each story into one of two categories: "fear of success" and "no fear." (Inter-rater reliability was .92.) The stories were placed into the "fear of success" group if they expressed any negative imagery reflecting concern over doing well. These included strong fears of social rejection as a result of success (including anxiety over becoming unpopular, unmarried, and lonely), worry over the definitions of womanhood (including guilt and despair over success and doubts about femininity and normality), and denial of the possibility that a woman might achieve such success. In addition to Horner's categories, small numbers of subjects wrote stories in which Anne endured some form of physical harm or death or in which she changed her plans to drop out of school because of the confidence which she gained from the high grades. Another common theme revolved around the denial of grades as a sufficient indicator of talent in the field.

The stories were placed in a "no fear" group if they expressed no negative imagery at all or if, in response to the elementary education questionnaire, the only evidence of negative imagery was the possibility of unemployment. It was decided that this category, especially since it appeared only in the responses to the elementary education questionnaire, did not fit into Horner's definition of fear of success. Rather than being a subjective fear of success, the possibility of not finding employment was a real problem supported by current job market statistics.

b. Field of study and career aspirations. On the second page of the questionnaire the woman was asked to indicate her present major field of study and her present classification (freshman, sophomore, junior, or senior). She was next asked for her career aspirations. Farmer and Bohn (8), in work with the Strong Vocational Interest Blank for Women, devised a method by which home-career conflicts could be experimentally reduced and found that women have higher occupational aspirations when they feel that society sanctions their choices. Using the Farmer and Bohn instructions, the woman was asked to pretend that (a) men like intelligent

women; (b) men and women are promoted equally in business and the professions; and (c) raising a family well is possible for a career woman. Given these circumstances, the woman was asked to indicate whether or not she would choose to pursue a career. If her answer was "yes," she was asked to indicate what career she felt she would like the most.

For analysis, the women's college majors were classified into traditional (feminine) or nontraditional (masculine) majors. Traditional majors were defined as those in which women have tended to cluster and in which women are generally accepted without prejudice at the undergraduate level, while nontraditional majors were those in which men dominate and in which women have not traditionally majored. Categorizations of most majors were easily made.

The career aspirations listed by the subjects were similarly classified into traditional or nontraditional groups. Decisions were made basically in the same fashion as they were for the majors.

The students' year in school was categorized for analysis into lower (freshman and sophomore) and upper (junior and senior) class groups, since there were relatively few seniors in the sample.

c. *Ascendancy and Masculinity scales.* The remainder of the questionnaire consisted of the Ascendancy and Masculinity scales of the Guilford-Zimmerman Temperament Survey (11). The Ascendancy scale consists of 30 questions which measure the degree of a person's striving, competitiveness, and dominance, with high scores indicating greater dominance. The mean score for women in the general population is 13.7 and for men is 15.9. This scale has a reliability coefficient of .82. The Masculinity scale also consists of 30 questions which discriminate well between men and women, with high scores indicating ruggedly individualistic, competitive, self-centered people. Low scores reflect passive-dependent attitudes and more cooperativeness than competitiveness. The mean score for women in the general population is 10.8 and for men is 19.9. This scale has a reliability coefficient of .85.

For analysis of Masculinity and Ascendancy scores, subjects were divided at the median into high- and low-scoring groups.

C. RESULTS

Overall, 119 of the 200 subjects indicated fear of success: 70 of those taking the medical school questionnaire and 49 of those taking the elementary education questionnaire.

There were 129 subjects having traditional and 68 having nontraditional

major fields of study. (Three subjects did not report a major and were excluded from those analyses involving a major.) There were 111 subjects having traditional occupational aspirations (including those who would choose not to work, since this has traditionally been woman's role) and 85 having nontraditional aspirations. (Four subjects who did not report their aspiration were excluded from the analysis involving aspiration.) In the school classification, there were 82 freshmen, 59 sophomores, 53 juniors, and six seniors, making a total of 141 lower class students and 59 upper class students.

On the Masculinity scale, these subjects had a mean score of 11.35 with a standard deviation of 3.95; they were slightly more masculine than women in the general population. On the Ascendency scale, however, the subjects had a mean score of 16.05 and a standard deviation of 5.26. They scored higher than both men and women in the general population.

Chi square tests of association were made to determine the relationship between fear of success and the other variables, including type of question presented to the subjects, masculinity, ascendency, college major, occupational aspiration, and year in college. Two relationships were statistically significant at the .05 level. First, fear of success occurred with greater frequency in response to the question dealing with the nontraditional (medicine) occupation than to the question dealing with the traditional (education) occupation ($\chi^2 = 9.15$; $p < .004$). Second, upper class (junior/seniors) students showed fear of success more frequently than did lower class (freshmen/sophomores) students ($\chi^2 = 4.74$; $p < .029$).

Since there was a significant association between fear of success and type of question, three-way chi square analyses (22) were made to determine associations between these two variables and each of the following: masculinity, ascendency, college major, occupational aspiration, and year in college. Table 1 summarizes the results of these analyses. The significant two-way associations already reported between fear and type of question and fear and year in college also appear here. The only three-way test that was significant was the relationship between fear, type of question, and ascendency. When the relationship between fear and type of question was analyzed at each level of ascendency, no significant association was found between fear of success and type of question for high ascendency students ($\chi^2 = .013$; $p < .908$); however, the low ascendency students showed greater frequency of fear responses to the medical school questionnaire than to the elementary education questionnaire ($\chi^2 = 17.25$; $p < .0001$).

TABLE 1
THREE-WAY CHI SQUARE ANALYSIS FOR FEAR OF SUCCESS,
TYPE OF QUESTION, AND OTHER VARIABLES

Analysis	Source	χ^2	df	p
Masculinity	Total	11.80	4	.019
	Fear by Question	9.15	1	.003
	Fear by Masculinity	.28	1	.632
	Question by Masculinity	2.00	1	.153
	Fear by Question by Masculinity	.42	1	.526
Ascendency	Total	20.81	4	.001
	Fear by Question	9.15	1	.003
	Fear by Ascendency	.09	1	.790
	Question by Ascendency	1.62	1	.200
	Fear by Question by Ascendency	9.97	1	.002
Major	Total	8.80	4	.068
	Fear by Question	8.19	1	.004
	Fear by Major	.39	1	.542
	Question by Major	.20	1	.661
	Fear by Question by Major	.02	1	.874
Aspiration	Total	10.31	4	.037
	Fear by Question	9.35	1	.003
	Fear by Aspiration	.05	1	.823
	Question by Aspiration	.19	1	.670
	Fear by Question by Aspiration	.73	1	.601
Year	Total	14.36	4	.007
	Fear by Question	9.15	1	.003
	Fear by Year	4.74	1	.028
	Question by Year	.22	1	.647
	Fear by Question by Year	.25	1	.622

D. DISCUSSION

The results of this study were consistent with Horner's (12) study of fear of success, in that a high frequency of fear of success was observed when dealing with a nontraditional masculine occupation. When the psychological stress and prejudice that society affords to women who succeed in masculine fields are considered, these results were to be expected (7, 15, 16). Even preschoolers refuse to accept aggressive girls (10); hence, aggressive women who enter such masculine fields as medicine may well be rejected. When there was confrontation with a traditional occupation, the observed frequency of fear dropped significantly; however, this number still represented approximately half of those taking the graduate education questionnaire. These latter results might be explained by the lack of confidence and tendency to belittle even realistic expectations indicated by girls found in earlier studies (4, 5). It is apparent that fear of success is related to one's

ascendency, although this relationship held true only for low ascendency. Several possibilities might be explored in an attempt to explain this relationship. Horner, consistent with Shaw and McCuen (20), attributed fear of success to women who were capable of success and were career-oriented rather than those not so inclined. She postulated that "Women who are not seeking success should not, after all, be threatened by it" (13, p. 38). If the assumption is made that those who are low in ascendency are not seeking success, as are those high in ascendency, then the results are clear with one exception. Why are women with low ascendency afraid of success in the nontraditional occupation? Perhaps they found the threat to one's affiliative need brought about by competition with males more dangerous than the cooperative activities involved in teaching. Teaching, in fact, could make them seem more competent in the role of mother which, as Douvan and Adelson (6) explained, might provide access to one's affiliative goal. In regard to the ascendency scores overall, it should be noted that this sample tested much higher than the overall population. This is not unexpected for college women. There is, of course, the chance that women's mean ascendency score for the general population has increased as a result of women's rights movements since the Guilford-Zimmerman Temperament Survey was published in 1949.

The significant findings in regard to the increase in fear of success with year in school are supported by Shaw and McCuen (20). The nearer in time a woman comes to being able actually to participate in the adult sex role, the more she will concentrate on her affiliative need and avoid her achievement needs. Unfortunately, very few seniors participated in this study because of the exclusion of those graduating during the semester that data were collected and the fact that comparatively few seniors reside in university housing.

In spite of research that would point to the contrary (15, 17, 21), this research does not lend support to the possibility that masculinity is related to fear of success. Perhaps correlates of masculinity have changed somewhat since the 1949 publication of the Guilford-Zimmerman test. Another measure might yield more positive results.

Unlike Horner's results, no relationship was found between fear of success and either college major or occupational aspiration. The difference here might be in the two samples. The University of Michigan, where Horner conducted her study, attracts a greater proportion of liberal arts students than does Purdue University.

Rossi (18) made the claim that society's traditional conceptions of masculinity and femininity are no longer appropriate or necessary in this day and age. These conceptions suppress equality and often prevent the emergence of socially valuable traits because of the sex-typing afforded to them. Women who have high intellects and ambitions often do not fulfill their own potentials because society frowns upon them. Rossi's comments are supported by the present results.

REFERENCES

1. BARDWICK, J. M. *Psychology of women*. New York: Harper & Row, 1971.
2. COLEMAN, J. S. *The adolescent society*. New York: Free Press of Glencoe, 1961.
3. CONNELL, D. M., & JOHNSON, J. E. Relationship between sex-role identification and self-esteem in early adolescents. *Devel. Psychol.*, 1970, **3**, 268.
4. CRANDALL, V. J., KATKOVSKY, W., & PRESTON, A. Motivational and ability determinants of your children's intellectual behaviors. *Child Devel.*, 1962, **33**, 643-661.
5. CRANDALL, V. J., DEWEY, R., KATKOVSKY, W., & PRESTON, A. Parents' attitudes and behaviors and grade-school children's academic achievements. *J. Genet. Psychol.*, 1964, **104**, 53-66.
6. DOUVAN, E., & ADELSON, J. *The adolescent experience*. New York: Wiley, 1966.
7. EPSTEIN, C. F. *Woman's place*. New York: Univ. California Press, 1971.
8. FARMER, H. S., & BOHN, M. J., JR. Home-career conflict reduction and the level of career interest in women. *J. Counsel. Psychol.*, 1970, **17**, 228-232.
9. FRENCH, E. G., & LESSER, G. S. Some characteristics of the achievement motive in women. *J. Abn. & Soc. Psychol.*, 1964, **68**, 119-128.
10. GREEN, E. H. Friendships and quarrels among preschool children. *Child Devel.*, 1933, **4**, 236-252.
11. GUILFORD, J. D., & ZIMMERMAN, W. S. *The Guilford-Zimmerman Temperament Survey Manual of Instructions and Interpretations*. Beverly Hills, Calif.: Sheridan Supply, 1949.
12. HORNER, M. Sex differences in achievement motivation and performance in competitive and noncompetitive situations. Unpublished doctoral dissertation, University of Michigan, Ann Arbor, 1968.
13. ———. Fail: Bright woman. *Psychol. Today*, 1969, **2**(6), 36-38, 62.
14. KAGAN, J., & MOSS, H. A. Birth to maturity. New York: Wiley, 1962.
15. MACCOBY, E. E. Woman's intellect. In S. M. Farber & R. H. Wilson (Eds.), *The Potential of Woman*. New York: McGraw-Hill, 1963. Pp. 24-39.
16. MEAD, M., & KAPLAN, F. B., Eds. *American Woman: The Report of the President's Commission on the Status of Women and Other Publications of the Commission*. New York: Scribner's, 1965.
17. PLANK, E. H., & PLANK, R. Emotional components in arithmetic learning as seen through autobiographies. In *The Psychoanalytic Study of the Child* (Vol. IX). New York: Internat. Univ. Press, 1954.
18. ROSSI, A. S. Equality between the sexes: An immodest proposal. *Daedalus*, 1964, **93**(2), 607-652.
19. ROSTOW, E. G. Conflict and accommodation. *Daedalus*, 1964, **93**(2), 736-760.
20. SHAW, M. C., & MCCUEN, J. T. The onset of academic underachievement in bright children. *J. Educ. Psychol.*, 1960, **51**, 103-108.

- 21. SONTAG, I. W., BAKER, C. T., & NELSON, V. A. Mental growth and personality development: A longitudinal study. *Monog. Soc. for Res. in Child Devel.*, 1958, 23.
- 22. WINER, B. J. Statistical Principles in Experimental Design. New York: McGraw-Hill, 1971.

Department of Child Development and Family Life
Purdue University
West Lafayette, Indiana 47907

TEACHER CHARACTERISTICS ASSOCIATED WITH STUDENT CLASSROOM BEHAVIORS*

*Department of Neurology, Medical College of Georgia;
and Department of Special Education, University of Georgia*

LAWRENCE C. HARTLAGE AND JUDITH SCHLAGEL

SUMMARY

Twenty-one teachers completed an Edwards Personnel Preference Schedule (EPPS) and rated 300 children in their classrooms on a five point behavior scale. Correlation coefficients were computed between 15 EPPS teacher characteristics and 14 classroom behaviors of children in their classrooms. Thirty-eight statistically significant correlations were found between teacher characteristics and children's classroom behavior.

A. INTRODUCTION

Although there have been a number of studies of the relationship between specific teacher behaviors and such student variables as achievement (12), creativity (10), and attending behavior (4, 11), there has been comparatively little research on the relationship between teacher characteristics and specific behaviors of students in their classrooms (2). There is reason to believe, however, that characteristics of teachers may be of considerable importance in their effects on children's classroom behavior. Converging evidence from clinical studies involving neurotic or schizophrenic classes of patients, for example, suggests that therapeutic outcomes for given types of patients tend to be significantly related to characteristics of therapists (3, 5, 8). These studies have all found changes in patient behavior to be related to therapist characteristics, even though the actual contacts between therapists and patients were limited to fairly brief encounters and made over a relatively short duration of time. Further, the relationship between "therapist types" and type of results has also been found in studies of untrained undergraduate students in therapy-analogue studies (1, 6, 9), suggesting that neither level of therapist expertise nor any unique components of the therapy situation are necessarily involved in the relationship. This study investigated the relationship between selected personality characteristics of teachers and the classroom behaviors of children assigned to their classes.

* Received in the Editorial Office on October 15, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

B. METHOD

1. *Subjects*

Three hundred children aged 7-14, who were enrolled in elementary public school classes, were individually rated by their classroom teachers ($N = 21$) after the completion of one full school year together. There were approximately equal numbers of children in each grade. Grades ranged from 1-8, as well as TMR (trainable mentally retarded) and primary and intermediate EMR (educable mentally retarded) classes.

2. *Rating Instruments*

Children were rated on a 49 item, five point behavior rating scale descriptive of classroom behaviors. Test-retest reliability of the instrument over a three week period resulted in reliability coefficients $> .90$ ($< .0001$) for 14 of the items, and these items were retained for the subsequent correlation study. Teachers' characteristics were measured with the Edwards Personal Preference Schedule (EPPS).

3. *Procedure*

All teachers were instructed in the use of the behavior rating scale and subsequently individually rated each individual child in their respective classes. Within a week of the completion of the classroom rating, each teacher completed the EPPS, and scores were subsequently converted into appropriate percentiles and then individually correlated with each of the behavioral rating factors with use of the Biomed O3D rank correlation coefficient program (7). There were 15 EPPS percentile scores correlated with 14 behavioral scores, for a total of 210 correlation coefficients.

C. RESULTS

A number of teacher characteristics correlated at significant levels with children's classroom behaviors. Table 1 shows the eight teacher characteristics that correlated with more than one classroom behavior. Two other teacher characteristics each correlated with one classroom behavior: Achievement (item #1, $r = .375$) and Endurance (item 13, $r = .412$); both $p < .05$. None of the remaining five EPPS teacher characteristics correlated at significant levels with any classroom behaviors.

In general, high Affiliation, Abasement, and Nurturance needs in teachers tended to be negatively correlated with desirable classroom behaviors in children, and positively correlated with undesirable behaviors. Intraception needs followed a similar pattern, while Deference, Autonomy, Aggression,

TABLE 1
CORRELATIONS BETWEEN EPPS TEACHER CHARACTERISTICS AND CHILDREN'S CLASSROOM BEHAVIORS

Behavior item	DEF	AUT	AFF	INT	ABA	NUR	AGG	CHG
1. Good attention span	.383	-.370				-.369		
2. Good sense of humor		.546*	-.567*	-.405				
3. Good emotional control			-.482		-.466			-.371
4. Works hard for approval	-.486						.375	
5. Well liked by classmates			-.487			-.445	.419	
6. A leader			-.523*			-.569*		
7. Happy			-.373		-.383	-.609*		
8. A good sport		.458				-.499		.464
9. Timid and shy			.467				.568*	
10. Cries easily			.472		.516*	.377		
11. Daydreams			.437			.379	-.418	
12. Whiney				.512*	.476			
13. Disrupts class				.483	.624*			
14. Tells lies			.442		.441			

Note: DEF = Deference; AUT = Autonomy; AFF = Affiliation; INT = Intraception; ABA = Abasement; NUR = Nurture; AGG = Aggression; CHG = Change.

* $p < .01$ (all other correlations $p < .05$).

and Change needs were somewhat more variably related to both desirable and undesirable classroom behaviors.

D. DISCUSSION

The fact that the correlation coefficients reached statistical significance with a student sample heterogenous on such variables as age, intellectual level, and number of years in school suggests that, with more homogenous grouping, even more pronounced relationships might occur. In terms of possible false positive types of error, while it is possible that among 210 correlations approximately 11 could reach the .05 level of significance by chance, the fact that there were 38 coefficients significant at or beyond the .05 level helps to obviate this potential artifact.

Since the design of the study was correlational, it cannot be inferred that the teacher characteristics resulted in the children's classroom behaviors. Further, there is a possibility that perceptions of children's behavior may be related to teacher characteristics, and this possible confounding factor must be kept in mind when interpreting the teachers' ratings of the children in their respective classrooms. On the other hand, data do suggest that there is a strong relationship between teacher characteristics and the behavior of children in their classrooms, at least as perceived by their teachers.

REFERENCES

1. ANZEL, A. A-B typing and patient socioeconomic and personality characteristics in a quasi-therapeutic situation. *J. Consult. & Clin. Psychol.*, 1970, **35**, 102-115.
2. BAKER, E. L. Relationship between learner achievement and instructional principles stressed during teacher preparation. *J. Educ. Res.*, 1969, **63**, 99-102.
3. BETZ, B. J. Studies of the therapist's role in the treatment of the schizophrenic patient. *Amer. J. Psychiat.*, 1967, **123**, 963-971.
4. BRODEN, M., BRUCE, C., MITCHELL, M., CARTER, V., & HALL, V. Effects of teacher attention on attending behavior of two boys at adjacent desks. *J. Appl. Behav. Anal.*, 1970, **3**, 199-203.
5. CARSON, R. C. A and B therapist "types": A possible critical variable in psychotherapy. *J. Nerv. & Ment. Dis.*, 1967, **144**, 47-54.
6. CARSON, R. C., HARDEN, J. A., & SHOWS, W. D. A-B distinction and behavior in quasi-therapeutic situations. *J. Consult. Psychol.*, 1964, **28**, 426-433.
7. DIXON, W. J. BMD—Biomedical Computer Programs. Los Angeles: Univ. California Press, 1968.
8. MCNAIR, D. M., CALLAHAN, D. M., & LORR, M. Therapist "type" and patient response to psychotherapy. *J. Consult. Psychol.*, 1962, **26**, 425-429.
9. SEIDMAN, E. A and B subjective-therapists' responses to videotaped schizoid and intropunitive-neurotic prototypes. *J. Consult. & Clin. Psychol.*, 1971, **37**, 201-208.
10. TURNER, R., & DENNY, D. A. Teacher characteristics, teacher behavior, and changes in pupil creativity. *Element. Sch. J.*, 1969, **69** (5), 265-270.

11. WALKER, H., & BUCKLEY, N. The use of positive reinforcement in conditioning attending behavior. *J. Appl. Behav. Anal.*, 1968, 1, 245-250.
12. WRIGHT, D. J., & NUTHALL, G. Relationships between teacher behaviors and pupil achievement in three experimental elementary science lessons. *Amer. Educ. Res. J.*, 1970, 7 (4), 477-491.

Department of Neurology
Medical College of Georgia
Augusta, Georgia 30902

PERSONALITY AND INNOVATIVE BUYING BEHAVIOR*

Department of Management and Marketing, The University of Tulsa

LOUIS E. BOONE

SUMMARY

The California Psychological Inventory was administered to a group of 50 first adopters of community antenna television service and 48 late adopters. First adopters scored significantly higher on 10 of the 18 scales: Dominance, Capacity for Status, Sociability, Social Presence, Self-Acceptance, Sense of Well-Being, Tolerance, and three achievement scales. Test scores indicated greater leadership potential, social mobility, self-confidence, and willingness to accept newness among the first adopters.

A. INTRODUCTION

A series of studies has been conducted in the past 10 years investigating the diffusion of consumer goods and services among final purchasers. The knowledge that research in other disciplines had revealed the possibility of identifying first adopters of such products and practices as hybrid seed corn, new drugs, and ham radio gradually "diffused" into the marketing area, and such organizations as Opinion Research Corporation, and such individual researchers, as Mueller, Bell, Frank, Gorman, and Robertson, discovered that early adopters of consumer goods, like their counterparts in agriculture and medicine, possessed a number of common characteristics (1, 2, 8, 9, 15, 16).

Consumer innovators tended to be younger in age, more highly educated, and more geographically and occupationally mobile; they earned higher incomes and were more likely to be employed as managers, officials, proprietors, or in the professions. The possibility of identifying the first adopters on the basis of the demographic variables has been repeatedly demonstrated.

Yet very little research has been conducted investigating the possible existence of common *personality* characteristics among the early adopters of new producer or consumer goods.

Two empirical studies have been conducted examining personality traits of early adopters of producer goods. In an exploratory study Rogers interviewed 23 farmers in an Iowa rural community and found that mental

* Received in the Editorial Office on October 15, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

rigidity and change orientation (dogmatism) appeared to be significantly related to farm practice adoption (18). Loy's investigation of the adoption of a new training method by swimming coaches revealed that adopters differed significantly from nonusers on such personality traits as dominance, sociability, and venturesomeness (14). Straus hypothesized that such traits as ascendancy, sociability, and venturesomeness would likely be associated with innovativeness (19). An attempt by Robertson and Myers to uncover personality differences among a group of California housewives who identified themselves as innovators was unsuccessful (17).

The most widely known investigations that tested the personality traits of consumers and attempted to link these traits to purchase decisions are the study of automobile purchases by Evans (7) and the use of the Edwards Personal Preference Schedule in attempting to relate personality characteristics and several product purchases by Koponen (12). In both cases the results were disappointing. Little differences were discovered that were statistically significant between the groups of purchasers. Other studies have been equally discouraging.

Two explanations have been offered for the failure of personality tests to fulfill the expectation that they might aid in the prediction of consumer behavior: (a) Standardized personality tests are too blunt an instrument to discover the subtle influences of personality in the purchase decision process. (b) The personality of the decision maker accounts for only a part of his decision criteria. Engel, Kollat, and Blackwell referred to personality as a moderator variable in a decision situation (6). The two explanations are obviously interrelated. Psychologists recognize that situational characteristics, as well as personality, affect human behavior (13).

It appears likely that personality plays only a partial role in leading to the development of brand loyalty, product choice, or store preferences. In these situations there is little possibility of isolating or predicting the probable degree of influence played by personality. The influence is likely to be subtle and may not appear as significant on the tailor-made personality inventories (11).

Brody and Cunningham (3) have pointed out that personality is likely to be of crucial importance only in situations where buyers are faced with risk—precisely the situation confronting the consumer innovator who exposes himself to possible financial loss and personal ridicule when he purchases new, untried products and services.

The present study was undertaken to determine whether the consumer

innovator could in fact be identified on the basis of distinguishable personality traits and to identify those traits possessed by the first adopters.

B. METHOD

The five-year-old community antenna television (CATV) system in a small southern city provided the subject for the research. Identification of all adopters and relative dates of adoption were available from the files of the local CATV franchise. Since the franchisee enjoyed a monopoly position in the city, the problem of determining time of adoption, which had plagued many producer and consumer goods studies, was avoided (5). A 10 percent systematic sample was selected containing 50 first adopters and 48 later adopters.

First adopters were defined as those sampling units who adopted CATV service during the initial three month period of operations in the city. Later adopters were defined as those residents who resided in the city at the time of the initial offering of CATV but failed to adopt until at least one year later. Personal interviews were conducted with each of the sampling units, and the 480-item California Psychological Inventory (CPI) was completed by each respondent.

The CPI, unlike many other personality inventories, is intended primarily for use with "normal" subjects. Its scales are principally designed to measure personality characteristics important for social living and interaction. Each scale is designed to cover one important facet of the individual personality, and the 18 scales provide a comprehensive portrait of the individual (10).

C. RESULTS

Analyses of variance reveal that the difference in scores of the first adopters and later subscribers were significant at the .05 level for 10 of the 18 scales of the CPI (see Table 1).

1. Dominance

The Dominance scale is designed to assess factors of leadership ability, dominance, persistence, and social initiative. High scores indicate leadership ability and initiative.

The first adopters typically possessed a much greater degree of social interaction than did the later adopters. They held a larger number of organized group memberships and offices, more access to impersonal sources of communications, and more frequent visits with friends, neighbors, and

TABLE 1
MEAN SCORES OF EARLY AND LATER ADOPTERS ON 10 SCALES OF
THE CALIFORNIA PSYCHOLOGICAL INVENTORY

Scale	Early adopters	Later adopters
Dominance	29.7	24.6
Capacity for Status	19.0	15.7
Sociability	25.0	20.1
Social Presence	31.8	26.7
Self-Acceptance	21.5	18.7
Sense of Well-Being	38.2	34.6
Tolerance	22.1	18.6
Achievement via Conformance	28.2	25.3
Achievement via Independence	18.7	16.7
Intellectual Efficiency	37.3	32.8

relatives—information sources as well as opportunities to display opinion leadership.

2. *Capacity for Status*

This scale is designed to measure the personal qualities and attributes that underlie and lead to status. High scores on this scale indicate that the first adopters of CATV are ambitious, active, and forceful; persons who are ascendant and self-seeking; persons who are effective in communication; and persons who possess a breadth of interests.

3. *Sociability*

The Sociability scale of the CPI identifies persons of outgoing, sociable, and participative temperaments. High scores are indicative of persons with an interest in social activities, persons who like to be with and work with others. High scorers are usually opinion leaders; low scorers tend to be submissive and overly influenced by the opinions of others.

The findings here support the conclusions of the classic drug study (4) in emphasizing the presence of opinion leadership among innovators.

4. *Social Presence*

This scale assesses factors of poise, spontaneity, and self-confidence in personal and social interaction. Low scorers are more deliberate and uncertain in their decisions, less original in their thinking than are higher scorers.

As in the previous measures of poise, ascendancy, and self-assurance, the innovators scored significantly higher than the later adopters, indicating the presence of poise and self-confidence in personal activities and inter-personal relationships.

5. *Self-Acceptance*

The relatively high scores on the Self-Acceptance scale indicate that the first adopters are usually aggressive and self-centered, and possess self-confidence and self-assurance.

Cognitive dissonance is typically present at the purchase of some new untried product or service, and confidence in one's ability to make wise decisions would likely be present more often in the innovator.

6. *Sense of Well-Being*

First adopters scored an average of 10 percent higher than did the later adopters on this scale, indicating individuals with ambition and the necessary personal confidence to make innovative purchases without having to rely upon the experience of others.

7. *Tolerance*

The Tolerance scale identifies persons with permissive, accepting, and nonjudgmental attitudes. High scorers are more open-minded and unprejudiced about beliefs and values different from their own. They commonly have broad and varied interests.

The presence of a tolerant personality appears to be an important prerequisite for innovative behavior. It is also possible that persons who deviate more tend to be more tolerant of deviation by others from the norms of society.

8. *The Achievement Scales*

The average scores of the first adopters were significantly higher than those of the later adopters on both of the Achievement scales and on the Intellectual Efficiency scale. It is particularly revealing to note that high scores on the Achievement via Independence scale denote individuals who have a strong need for achievement and who are at their best in new or untried situations where they must work on their own without external guidance.

D. CONCLUSIONS

The first adopter possessed different personality traits from the later adopter. He exhibited more leadership potential, was socially mobile, and possessed more self-confidence, a greater acceptance of newness, and higher achievement levels than the later adopter.

In addition to providing a profile of the first adopters, the study has suggested that personality trait analysis may indeed be a very valuable tool

in "major" situations: situations where the individual consumer is required to make major new decisions without the assistance of experience—and approval—of others.

REFERENCES

1. AMERICA'S TASTEMAKERS. Princeton, N. J.: Opinion Res. Corp., 1951.
2. BELL, W. E. Consumer innovators: A market for newness. In S. A. Greyser (Ed.), *Toward Scientific Marketing*. Chicago: Amer. Market. Assoc., 1964. Pp. 85-93.
3. BRODY, R. P., & CUNNINGHAM, S. M. Personality variables and the consumer decision process. *J. Market. Res.*, 1968, 5, 50-57.
4. COLEMAN, J., KATZ, E., & MENZEL, H. The diffusion of an innovation among physicians. *Sociometry*, 1957, 20, 253-270.
5. COUGHENOUR, C. M. The problem of reliability of adoption data in survey research. *Rural Sociol.*, 1965, 30, 184-203.
6. ENGEL, J. F., KOLLAT, D. T., & BLACKWELL, R. D. *Consumer Behavior*. New York: Holt, Rinehart & Winston, 1973. P. 300.
7. EVANS, F. B. Psychological and objective factors in the prediction of brand choice: Ford versus Chevrolet. *J. Business*, 1959, 32, 340-369.
8. FRANK, R. E., et al. The determinants of innovative behavior with respect to a branded, frequently purchased food product. In L. G. Smith (Ed.), *Reflections on Progress in Marketing*. Chicago: Amer. Market. Assoc., 1964. Pp. 312-323.
9. GORMAN, W. P., III, & MOORE, C. T. The early diffusion of color television receivers into a fringe area market. *J. Retailing*, 1968, Fall, 46-56.
10. GOUGH, H. G. Manual for the California Psychological Inventory. Palo Alto, Calif.: Consult. Psychol. Press, 1964.
11. KASSARJIAN, H. H. Personality and consumer behavior: A review. *J. Market. Res.*, 1971, 8, 409-418.
12. KOPONEN, A. Personality characteristics of purchasers. *J. Advert. Res.*, 1960, 1, 6-12.
13. LEWIN, K. *Field Theory in Social Science*. New York: Harper & Row, 1951. P. 62.
14. LOY, J. W., JR. Social psychological characteristics of innovators. *Amer. Sociolog. Rev.*, 1969, 34, 73-82.
15. MUELLER, E. The desire for innovations in household goods. In L. H. Clark (Ed.), *Consumer Behavior: Research on Consumer Reactions*. New York: Harper, 1958. Pp. 27-36.
16. ROBERTSON, T. S. *Innovative Behavior and Communication*. New York: Holt, Rinehart & Winston, 1971.
17. ROBERTSON, T. R., & MYERS, J. G. Personality correlates of opinion leadership and innovative buying behavior. *J. Market. Res.*, 1961, 6, 164-168.
18. ROGERS, E. M. Personality correlates of the adoption of technological practices. *Rural Sociol.*, 1957, 22, 267-268.
19. STRAUS, M. A. Personality testing the farm population. *Rural Sociol.*, 1956, 21, 293-294.

Department of Management and Marketing
 The University of Tulsa
 600 South College
 Tulsa, Oklahoma 74104

PERCEIVER SEX AND EXPRESSOR SEX AS RELATED TO COGNITIVE PERCEPTION*

Tennessee Technological University

BILL C. EDWARDS AND JETTIE M. McWILLIAMS

SUMMARY

Perceiver sex and expressor sex effects on cognitive perception were investigated. Male and female college students watched videotaped sessions of male and female expressors. Each expressor talked for three minutes about each of three prescribed subject areas. Perceivers then reacted to a semantic differential as they thought the expressors had previously reacted. Absolute difference scores were established for each perceiver-expressor combination indicating level of cognitive perception accuracy. Analysis of effects of the variables was made by use of a two factor analysis of variance. Expressor sex was found to have a significant effect. Implications were discussed regarding effects of expressor sex on person perception and the potential for differential approach to the sexes in the helping professions.

A. INTRODUCTION

The way in which individuals perceive one another affects the way in which they behave in relation to one another (5). As our knowledge of perception increases, our understanding of the interaction between person perception and interpersonal behavior should grow. The ability to perceive accurately seems necessary for effective interpersonal behavior.

It should be emphasized that the subjects in the literature cited, as well as those in this study, have been limited to American college students. The selective aspect of perception may be influenced by certain characteristics of the perceiver, such as personality attributes, age, sex, etc. Kozel and Gitter (6) found females to be superior to males in perception of emotions. Sex of the expressor was found to affect the accuracy of judgment of perceivers (1, 7, 9). Warr and Knapper (11), Tagiuri (10), and Cronbach (2), after a comprehensive review of the literature, concluded that, with regard to the judgment of emotion and the accurate perception of self and others, the findings are equivocal for both sexes.

* Received in the Editorial Office on October 18, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

As the review of literature in the area of person perception is brought to focus, it appears to the present investigators that perhaps one of the most important areas of human behavior—verbal behavior—has been neglected. Perception research appears to have been pointed toward the perception of emotions, traits, dispositions, and other global factors. The study of perception of verbal behavior seems appropriate. It was the purpose of this study to investigate the relationships between cognitive perception and sex of both perceiver and expressor (stimulus person).

B. METHOD

1. *Subjects*

All undergraduate students registered for an introductory psychology course at Tennessee Technological University participated. This population is primarily rural Anglo Saxon. Students who were more than casually acquainted with target persons, were beyond age 23, or who did not complete the instrument satisfactorily were eliminated from the study. This procedure resulted in a subject pool of 65 males and 97 females. One male and female were randomly deleted in order to attain an exact 1 to 1-1/2 male to female ratio. Thus, the final subject group included 64 males and 96 females.

2. *Instruments*

The method of measuring cognitive perception consisted of the administration of a semantic differential (SD) to expressors who had just talked for a videotaping session, and subsequently to Ss after they watched the taped sessions. Subjects were instructed to complete the SD as they thought the expressors had completed it previously. Perception scores were derived by calculating and summing the absolute difference between expressor and subject reactions to individual items of the SD.

Subject areas for discussion by expressors were arrived at empirically by asking classes of undergraduate students to list their most urgent concerns. The three most popular areas were grades, family, and money. Twelve potential expressors (undergraduates) were invited to participate in research for extra credit. Eleven came as scheduled and were instructed individually to talk for three minutes about each of the three topics. Their talks were videotaped. The SD was administered to each expressor immediately after the nine-minute session.

The 11 sessions of nine minutes each were shown to an upper division class of 35 students who voted on the expressiveness of the expressors. Two

males and two females were chosen as being most expressive. The four sessions were transferred to one tape for presentation to Ss.

The SD consisted of the three area concepts (grades, family, money) plus three concepts for masking purposes (God, life, people). The adjective pairs included good-bad and false-true, representing the evaluative dimension; active-passive and fast-slow, representing the activity dimension; strong-weak and hard-soft, representing the potency dimension.

3. Procedure

The viewing and testing procedure consisted of a total class viewing one expressor for nine minutes as he/she talked for three minutes about each of the three subject area. Subjects then reacted to the SD as they believed the expressor had reacted to it previously. This was repeated for each of the other three expressors. Order of presentation of expressors to classes was randomized to avoid a learning effect bias.

Semantic differential difference scores were established by totaling the absolute difference between responses of subjects and expressors. Six scores were calculated for each subject—one for each of the dimensions (evaluative, potency, activity) for each expressor sex. Concepts used for masking purposes were ignored in the calculation of scores. Low scores indicated similarity between choices made by the expressor and the subject or more accurate cognitive perception. High scores indicated less accurate cognitive perception.

C. RESULTS

Analysis of difference scores was made by use of a two factor analysis of variance with unequal *ns.* (4). *F* ratios indicated a significant difference in accuracy of perception of different sex expressors. An *F* ratio of 101.38, $p < .001$ indicated that females were perceived more accurately in the evaluative dimension. Males were perceived more accurately in the potency dimension ($F = 114.18$, $p < .001$) and in the activity dimension ($F = 305.80$, $p < .001$). No difference was found in accuracy of perception by different sex perceivers.

D. DISCUSSION

The results regarding perceiver sex support Warr and Knapper's (11) summary statement that findings of sex differences in person perception are few. This finding in the area of cognitive perception, in addition to previous findings in the areas of emotion perception and dispositional perception,

adds to the expectation that this and future research will eventually support a conclusion that the sexes are not different in the accuracy of perception of others.

The findings of expressor sex differences among college students tend to substantiate and fall in line with the findings of Gitter and Black (3), Levy and Schlosberg (7), Bronfenbrenner, Harding, and Gallwey (1), and Sechrest and Jackson (9) that female expressors were more accurately perceived than male expressors, but that the sex of the perceiver did not significantly influence perception.

Significant differences in expressor sex in cognitive perception appear important. This may be seen as a strong implication that effects of expressor sex differences should be investigated in other facets of person perception.

The finding that college-age male expressors are perceived more accurately in two of the semantic dimensions (potency and activity), as compared to the more accurate perception of college females in one dimension (evaluative), may appear weighted with regard to being accurately perceived in favor of males. The fact, however, that the evaluative dimension has been consistently shown in factor analysis to account for over one-half of the variance (8) indicates that there are differences and implies a communicative advantage to females.

The finding that the sexes in a college population are differently perceived hints strongly that their communicative behaviors, either verbal or non-verbal or both, are different. This could be a direct manifestation of different personality structures or orientations. Perhaps the study of cognitive aspects of personality is an important and neglected area of study. It would seem that some fairly strong relationships between the way a person is perceived and sex-related characteristics might be expected. Perhaps, for example, there might be a strong relationship between the evaluative dimension of cognitive perception and femininity as defined by our culture. Variables related directly to the verbal communication process and content and the perception of that communication should be a viable and potent area of research.

REFERENCES

1. BRONFENBRENNER, U., HARDING, J., & GALLWEY, M. The measurement of skill in social perception. In D. C. McClelland, A. L. Baldwin, U. Bronfenbrenner, & F. L. Strodthack, *Talent and Society*. Princeton, N. J. Van Nostrand, 1958. Pp. 29-111.
2. CRONBACH, L. J. Proposals leading to analytic treatment of social perception scores.

- In R. Tagiuri & L. Petrullo (Eds.), *Person Perception and Interpersonal Behavior*. Stanford, Calif.: Stanford Univ. Press, 1958.
3. GITTER, A. G., & BLACK, H. Expression and perception of emotion: Race and sex. Publication No. 19, Communication Research Center, Boston University, Boston, Massachusetts, 1968. P. 42.
 4. GLASS, G. V., & STANLEY, J. C. *Statistical Methods in Education and Psychology*. Englewood Cliffs, N. J.: Prentice-Hall, 1970.
 5. HAMMOND, K. R., WILKINS, M. M., & TODD, F. J. A research paradigm for the study of interpersonal learning. *Psychol. Bull.*, 1966, **65**, 221-232.
 6. KOZEL, N. J., & GITTER, A. G. Perception of emotion: Differences in mode of presentation, sex of perceiver and race of expressor. Publication No. 18, Communication Research Center, Boston University, Boston, Massachusetts, 1968. P. 36.
 7. LEVY, N., & SCHLOSBERG, H. Woodworth scale values of the Lightfoot pictures of facial expression. *J. Exper. Psychol.*, 1960, **60**, 121-125.
 8. OSGOOD, C. E., SUCCI, G. J., & TANNENBAUM, P. H. *The Measurement of Meaning*. Urbana: Univ. Illinois Press, 1957.
 9. SECHREST, L., & JACKSON, D. N. Social intelligence and accuracy of interpersonal predictions. *J. Personal.*, 1961, **29**, 167-182.
 10. TAGIURI, R. Person perception. In G. Lindzey & E. Aronson, *The Handbook of Social Psychology*. Reading, Mass.: Addison-Wesley, 1969. Pp. 395-449.
 11. WARR, P. B., & KNAPPER, C. *The Perception of People and Events*. New York: Wiley, 1968.

Department of Educational Psychology
Tennessee Technological University
Cookeville, Tennessee 38501

ALTRUISM AS A FUNCTION OF RESPONSE COST TO THE BENEFACTOR*

Virginia Commonwealth University

ROBERT M. TIPTON AND LARRY JENKINS

SUMMARY

This study investigated the effects of response cost on the acquisition of instrumentally conditioned helping behavior. One group of Ss were placed in the position of being able to help a confederate (C), by delivering him from electric shock, at the same time risking the possibility of being penalized (cost to benefactor) for this helping behavior. A second group of Ss were also placed in the position of being able to help a C, but without any risk of penalty. A third group, which was not in a position of helping anyone, served as a control group. Results supported previous research indicating that helping responses have inherent reinforcing value. When a cost variable is introduced into a situation inviting an altruistic response, however, altruistic behavior tends to be suppressed, and the likelihood of learning the particular response is decreased.

A. INTRODUCTION

A burgeoning of interest in positive forms of behavior has given rise to considerable research, with the areas of altruism and helping behavior being given particular attention. Several explanations accounting for helping behavior have been posited, including the existence of a social responsibility norm (5, 11, 12); guilt reaction (7, 9, 13); dependency, obligation, and reciprocity (4, 5, 10); modeling (6, 11, 14); and reinforcement (1, 2, 8). Weiss, Boyer, Lombardo, and Stich (16) and Weiss, Buchanan, Alstatt, and Lombardo (17) found that altruistic behavior could be inherently rewarding, and that an altruistic act could provide sufficient reinforcement to condition an instrumental response.

Weiss *et al.* (17) showed that the instrumental escape conditioning paradigm can account for altruistic behavior: i. e., "people will learn an instrumental conditioned response, the sole reward for which is to deliver another human being from suffering" (p. 1262). In that study the instrumental re-

* Received in the Editorial Office on October 18, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

sponse was the pushing of a button that terminated the apparent suffering of another subject who was ostensibly receiving electric shock (negative reinforcement). The study, however, did not consider one variable that is almost invariably present in situations inviting altruistic responses—cost to the benefactor. In "real life situations" when assistance is given, there is typically some cost to the benefactor which may be in terms of money, time spent, physical or mental energy expended, restriction of freedom, risk of embarrassment, or other psychological costs. The purpose of the present study was to investigate the effects of cost to the benefactor on the acquisition and performance of instrumentally conditioned helping behavior. It was predicted that the performance of helping behavior would be inherently reinforcing when the response cost was low or nonexistent, but its inherent reinforcing value would decrease if the response cost increased.

B. METHOD

1. Subjects

Ss were 60 Virginia Commonwealth University General Psychology students who were given a small amount of course credit for their participation.

2. Procedure

Ss were randomly assigned to one of the three groups containing equal numbers of males and females. Individual appointments were made for each *S*. At about the same time that each *S* arrived for the experiment, a male confederate (*C*) also arrived, posing as a second *S*. General instructions were administered to the real Ss only. The apparent purpose of having *Cs* absent at this time was to prevent them from knowing the Ss' task. Actually it prevented the *C* from knowing the experimental group to which the Ss had been assigned. Ss were exposed to one of the three following conditions, depending on the group to which they had been assigned:

a. Shock-Cost (S-C). The general instructions for this group informed them that the purpose of the study was to investigate judgments made about people performing motor tasks under stress. It was indicated that one *S*, while under the stress of receiving an electric shock, would perform the task of steadying a metal stylus on a rotating disc. The shock was described as being uncomfortable but not dangerous. The *c* was arbitrarily designated as the "subject" who would receive the shock.

The special instructions given to the real Ss in this group informed them that they were to judge the performance of "the other subject" (confederate), taking into consideration both the number of errors (times stylus slipped

off the disc) and duration of errors (length of time off target), but making only one judgment for each of 12 performance trials (a buzzer sounded continuously when the confederate was off target).

The beginning of each performance trial was signaled by the *E*'s saying "ready." At the onset of each trial *C* jerked his free arm to which an electrode was attached and made mild facial grimaces, feigning discomfort from the apparent shock. This behavior was continued intermittantly throughout each trial. Also at the beginning of each trial a needle on a voltage meter (visible to the *S*) to which the electrode leads were attached immediately registered, and a red light on the voltage meter box flashed on. After 15 seconds had passed, a light flashed on in front of the *S* signaling him to make his rating of the *C*'s performance on that trial by pressing one of a panel of buttons ranging from 1 to 9 indicating poor to excellent performance. Simultaneously with the *S* making his judgment (by pressing one of the nine buttons), the voltage ceased to register on the voltage meter, the red light on the box went off, and the *C* sighed with apparent relief that the "shock" had been terminated, at the same time straightening his "shocked" arm. The association between pressing one of the nine buttons and termination of the shock to the *C* was readily apparent to the *S*.

The special instructions for *S*s in this experimental group also informed them that the *C*'s performance was being monitored by a "preprogrammed computer-like apparatus" and that the *S*s' judgments (ratings) of the confederate's performance would be evaluated by the apparatus. *S*s were informed that they could earn from zero to 10 points for their ratings on each of the 12 trials depending on how good their ratings were. They were also told that in order to insure that they were "really trying" to make good ratings, a penalty of having to remain an additional hour and work at another experiment involving some boring task would be applied if they did not attain a total score of at least 60 points on all 12 trials. Their scores, which in fact were comprised of one of several lists of arbitrary scores (in all cases totaling slightly more than 60), were "fed back" to them via a cumulative counter mounted on a panel in front of them immediately after they made their ratings on each of the 12 trials. Assigning points to *S*s on the basis of the "accuracy" of their ratings placed them in the dilemma of either helping the confederate (quickly pressing a button) and risking a penalty, or concentrating on making accurate ratings (resulting in slower reaction speed), thereby allowing the *C*'s apparent suffering to continue.

b. Shock-No Cost (S-NC). This group was treated exactly as the *SC* group, except that these *S*s were not given points for the accuracy of their

ratings, and they therefore were not vulnerable to the penalty of having to remain an additional hour to work on some "boring task." Ss in this group, then, had the opportunity to help the C by quickly delivering him from apparent shock without facing the possibility of incurring a penalty (cost) as the result of hasty responses.

c. *No Shock-No Cost (NS-NC)*. For Ss in this group the instructions were the same as for the S-NC group except that no mention was made of the C receiving shock, and all apparatus pertaining to the administration of shock were removed from sight. Ss in this group served as a control for practice effect, since they neither had the opportunity to "help" by pressing a button quickly nor were they induced to deliberate on their responses by threat of penalty.

C. RESULTS AND DISCUSSION

The statistical treatment was designed to determine if the awareness of behaving altruistically resulted in learning effect (increased response speed over trials) and, if so, whether benefactor cost suppressed the learning effects. For statistical analysis the data from the 12 trials were collapsed into four blocks of trials (each block containing the average of three trials). Figure 1 shows the mean reaction speeds (reciprocal seconds) for Ss in each of the three groups for each block of trials. Note that the NS-NC and S-C groups appear to have reached asymptote while the reaction speed of the S-NC group continued to increase over the last block of trials. Analyses of variance computed over blocks of trials for each of the three groups, S-NC ($F = 7.77$, $df = 3/76$, $p < .005$), NS-NC ($F = 3.17$, $df = 3/76$, $p < .01$), and S-C ($F = 3.2$, $df = 3/76$, $p < .01$) were all found to be significant.

Although all three groups showed significant increments in reaction speed over the four blocks of trials, the greater level of significance as well as the acquisition curve in Figure 1 suggest an acquisition speed for the S-NC group greater than could be accounted for by practice effect alone. In order to determine if something other than practice influenced learning in the S-NC group, it was necessary to test for a difference in acquisition response speed between the S-NC and NS-NC groups. Response speed increments for subjects between blocks 1 and 4 were compared for these groups and found significant ($t = 6.5$, $p < .01$). That is, the difference in response speed between block 1 and block 4 was greater for the S-NC group than for the NS-NC group. The S-NC group also showed a greater rate of acquisition than the S-C group ($t = 11.38$, $p < .01$); and there was no difference between the NS-NC group and S-C group in response speed acquisition ($t = 1.33$, $p > .10$).

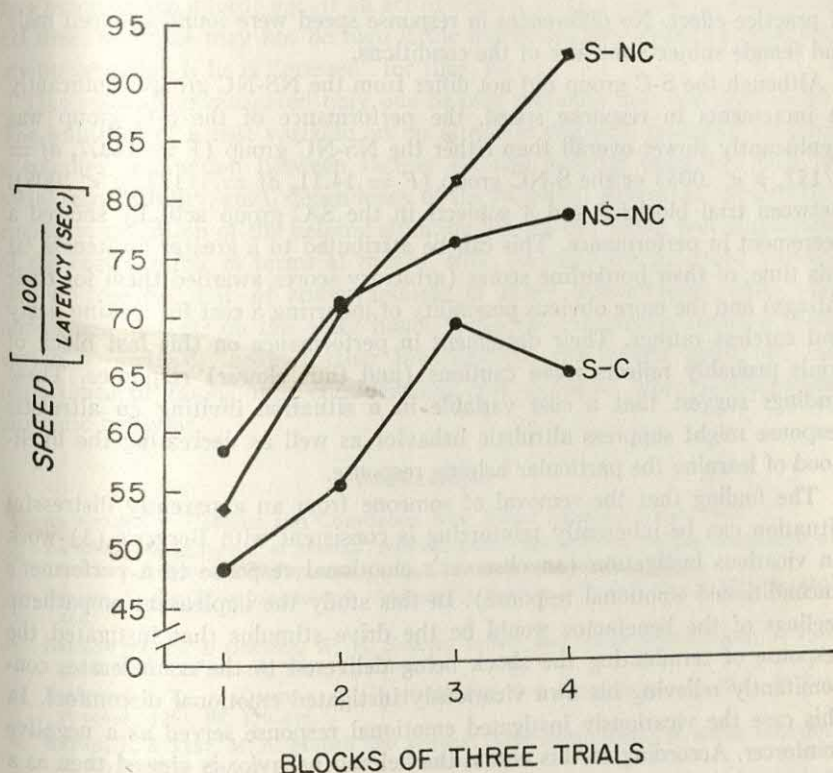


FIGURE 1

MEAN RESPONSE SPEEDS (RECIPROCAL SECONDS OF RESPONSE LATENCY) OF SUBJECTS UNDER THREE CONDITIONS ON SUCCESSIVE BLOCKS OF THREE TRIALS: SHOCK-COST (S-C), NO SHOCK-NO COST (NS-NC), AND SHOCK-NO COST (S-NC)

These results show that the altruistic act of delivering another individual from suffering may be sufficient reinforcement to bring about the learning of an instrumental response. The observation or awareness of someone suffering apparently served as a noxious stimulus, the removal of which reinforced subjects' responses. This finding is consistent with those of Weiss *et al.* (17). However, when a cost variable was introduced (i. e., when subjects were faced with the possibility of incurring a penalty for behaving altruistically), the reinforcing value of the altruistic behavior was suppressed. Subjects in the S-C group did not differ in increments of response speed between trial blocks 1 and 4 from the control group (NS-NC). Thus increments in response speed for the S-C group might be accounted for solely on the basis

of practice effect. No differences in response speed were found between male and female subjects for any of the conditions.

Although the S-C group did not differ from the NS-NC group significantly in increments in response speed, the performance of the S-C group was significantly slower overall than either the NS-NC group ($F = 10.07$, $df = 1/152$, $p < .005$) or the S-NC group ($F = 14.11$, $df = 1/152$, $p < .005$). Between trial blocks 3 and 4 subjects in the S-C group actually showed a decrement in performance. This can be attributed to a greater awareness, at this time, of their borderline scores (arbitrary scores awarded them for their ratings) and the more obvious possibility of incurring a cost for making hasty and careless ratings. Their decrement in performance on this last block of trials probably reflects more cautious (and thus slower) responses. These findings suggest that a cost variable in a situation inviting an altruistic response might suppress altruistic behavior as well as decreasing the likelihood of learning the particular helping response.

The finding that the removal of someone from an apparently distressful situation can be inherently reinforcing is consistent with Berger's (3) work on vicarious instigation (an observer's emotional response to a performer's unconditioned emotional response). In this study the unpleasant empathetic feelings of the benefactor would be the drive stimulus that instigated the response of terminating the shock being delivered to the confederate, concomitantly relieving his own vicariously instigated emotional discomfort. In this case the vicariously instigated emotional response served as a negative reinforcer. According to this notion the helping behavior is viewed then as a consequence of the benefactor's motivation to alleviate his own empathetic distress. On the other hand one could just as well conceptualize the learning situation in terms of the positive empathetic feeling of the benefactor brought about by the apparent relief and pleasure of the recipient as his shock is terminated. In the latter case the positive emotion experienced by the benefactor as the result of his helping response served as a positive reinforcer.

The finding that cost to the benefactor may suppress helping behavior can best be explained in terms of Thibaut and Kelley's (15) economic theory of social interaction which in effect states that an individual's behavior in interpersonal situations is governed by the relative cost and reward to the individual. In this study when the cost of the helping response went up in relation to its reward, helping behavior diminished. Although it was not investigated in the present study, one might hypothesize that the effectiveness of a cost factor in suppressing a helping response in a given individual is dependent on

how much he can afford; e.g., if an act of helping costs a person 15 minutes of his time, the price may not be high if the individual has plenty of time, but may be very high if he is "pressed" for time, etc.

This research investigated only one helping response and one cost factor. The influence of a cost variable on an altruistic response probably involves a complex interaction between factors eliciting helping behavior, such as social responsibility, guilt, dependency of the recipient, obligation, reciprocity, empathy, definition of the helping situation, on the one hand, and magnitude of the cost variable in terms of money, time, physical energy spent, restriction of freedom, risk of embarrassment or other psychological costs, and remoteness of costs on the other hand. While the interaction between these variables obviously needs further investigation, the results point out the importance of taking into consideration cost variables when investigating altruistic behavior.

REFERENCES

1. ARONFREED, J. *Conduct and Conscience*. New York: Academic Press, 1968.
2. BANDURA, A. Influence of models' reinforcement contingencies on the acquisition of imitative responses. *J. Personal. & Soc. Psychol.*, 1965, **1**, 589-595.
3. BERGER, S. Conditioning through vicarious instigation. *Psychol. Rev.*, 1962, **69**, 450-466.
4. BERKOWITZ, L., & CONNER, W. H. Success, failure and social responsibility. *J. Personal. & Soc. Psychol.*, 1966, **4**, 664-669.
5. BERKOWITZ, L., & DANIELS, L. Responsibility and dependency. *J. Abn. & Soc. Psychol.*, 1963, **66**, 429-436.
6. BRYAN, J., & TEST, M. A. Models and helping: Naturalistic studies in aiding behavior. *J. Personal. & Soc. Psychol.*, 1967, **6**, 400-407.
7. CARLSMITH, J. M., & GROSS, A. E. Some effects of guilt on compliance. *J. Personal. & Soc. Psychol.*, 1969, **11**, 232-240.
8. FISCHER, W. F. Sharing in preschool children as a function of amount and type of reinforcement. *Genet. Psychol. Monog.*, 1963, **68**, 215-245.
9. FREEDMAN, J. L., WELLINGTON, S. A., & BLESS, E. Compliance without pressure: The effect of guilt. *J. Personal. & Soc. Psychol.*, 1967, **7**, 117-124.
10. GOULDNER, A. The norm of reciprocity: A preliminary statement. *Amer. Sociolog. Rev.*, 1960, **25**, 161-178.
11. HORNSTEIN, H. A., FISCH, E., & HOLMES, M. The influence of a model's feeling about his behavior and his relevance as a comparison other on observers' behavior. *J. Personal. & Soc. Psychol.*, 1968, **10**, 222-226.
12. LEEDS, R. Altruism and the norm of giving. *Merrill-Palmer Quart.*, 1963, **9**, 229-240.
13. RAWLINGS, E. I. Witnessing harm to others: A reassessment of the role of guilt in altruistic behavior. *J. Personal. & Soc. Psychol.*, 1968, **10**, 377-380.
14. ROSENHAN, D., & WHITE, G. M. Observation and rehearsal as determinants of pre-social behavior. *J. Personal. & Soc. Psychol.*, 1967, **5**, 424-431.
15. THIBAUT, J., & KELLEY, H. H. *The Social Psychology of Groups*. New York: Wiley, 1959.

16. WEISS, R. F., BOYER, J. L., LOMBARDO, J. P., & STICH, M. H. Altruistic drive and altruistic reinforcement. *J. Personal. & Soc. Psychol.*, 1973, 25, 390-400.
17. WEISS, R. F., BUCHANAN, W., ALSTATT, L., & LOMBARDO, J. P. Altruism is rewarding. *Science*, 1971, 171, 1262-1263.

Department of Psychology
Virginia Commonwealth University
901 West Franklin Street
Richmond, Virginia 23220

ATTITUDE-BEHAVIOR CONSISTENCY AS A FUNCTION OF GENERALITY EQUIVALENCE BETWEEN ATTITUDE AND BEHAVIOR OBJECTS*

Department of Sociology, Central Michigan University

ALLEN E. LISKA

SUMMARY

Recently, social psychologists have set forth various hypotheses concerning the conditions that may affect the extent of attitude-behavior consistency. In this research we test the hypothesis, generally suggested by Fishbein, that attitude-behavior consistency is affected by the extent to which attitude and behavior are measured at approximately an equivalent level of generality. Behavior was measured at two levels of generality, and attitude was measured at five levels of generality. As the various attitudes were found to be moderately related, a multiple regression analysis was employed to estimate the independent effects and combined additive effects of the attitudes on each of the two levels of behavior. Briefly, the data supported the hypothesis, showing that both specific and general patterns of behavior were only affected by attitudes measured at an equivalent level of generality.

A. INTRODUCTION

Recently, researchers have shown considerable renewed concern over the inconsistent relationship between attitudes and behavior reported in the literature. Although isolated voices of concern appeared in the 1930's (8), much of the concern first appeared in the early 1950's. Similar findings have continued throughout the years, culminating in an impressive review by Deutscher (6) and generating considerable discussion and reevaluation of the attitude concept and its theoretical relationship to behavior (6, 7, 10, 11). That is, rather than either assuming a one to one relationship between attitude and behavior or documenting the contrary, recently various sociologists and social psychologists have reconceptualized the problem as that of identifying the conditions that affect the direction and the extent of the relationship. For a general summary of theoretical and methodological conditions that have been employed to explain attitude-behavior inconsistency, see Wicker (16) and Liska (9).

* Received in the Editorial Office on October 23, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

In this paper we deal with one such condition: the relationship between the attitude object and the behavior object. To quote Fishbein (7, p. 214), "We have often measured attitude toward an inappropriate stimulus object—thus, for example, we have often measured attitude toward a class of people or objects when we should have been measuring attitude toward a particular member of the class." Fishbein seems to be saying that if we wish to predict behavior toward a specific attitude object, then we should measure attitude toward that specific object. This directive is apparently based on the implicit assumption that members of a general class of objects are seldom completely homogeneous. Hence, given some degree of heterogeneity between members of a general class, while a general attitude may well predict commonalities in behavior (a general behavioral orientation) toward most members of the general class, it may not be a good predictor of behavior toward a particular member of the class. Such may be best predicted by attitude toward the specific member. Furthermore, implied in the logic of this argument but not explicitly stated by Fishbein, if we wish to predict behavior toward a general class of objects, then we should measure attitude toward that general class. For if a class of objects is not completely homogeneous, then attitude toward any particular member of the class will not be very useful in predicting behavior toward the total class. Generally, then, Fishbein seems to be arguing that a strong relationship between attitude and behavior depends on the extent to which attitude and behavior are measured at an equivalent level of generality.

Furthermore, recent research (1, 12, 17) suggests that attitude toward behavior is a better predictor of the behavior than attitude toward the object of that behavior. Specifically, using a two person prisoner dilemma game situation, Ajzen and Fishbein (1) have reported that attitude toward a particular activity involving the other player is a better predictor of engagement in that activity than attitude toward the other player. Wicker (17) has reported that attitude toward a particular religious activity is a better predictor of engagement in that activity than attitude toward the local church. And Rokeach and Kliejunas (12) have reported that attitude toward attending class is a better predictor of attending class than attitude toward the particular professor.

In this paper we focus our attention on the generality equivalence hypothesis; and as a result of the findings by Ajzen and Fishbein, Wicker, and Rokeach and Kliejunas, we limit the analysis to attitudes toward behavior. In reviewing the literature, we could locate only one study that functions to test this hypothesis. Wicker and Pomazal (18) have reported the emer-

gence of a much stronger relationship between a specific attitude toward participation as a subject in psychological research and actual participation in a psychological experiment, than between a general attitude toward psychological or scientific research and actual participation in a psychological experiment. The results should be considered with extreme caution, as the effect of the general attitude toward scientific research was not controlled while observing the relationship between the specific attitude toward participation in psychological research and actual participation in a psychological experiment, and the effect of the specific attitude toward participation in psychological research was not controlled while observing the relationship between the general attitude toward scientific research and actual participation in a psychological experiment. Such, of course, is necessary, as Wicker and Pomazal report that a strong relationship exists between the general attitude toward scientific research and the specific attitude toward participation in a psychological experiment. Also, they do not examine the relationship between the general attitude toward scientific research and a relevant general behavior pattern. For if the generality equivalence hypothesis is correct, then a substantial relationship should obtain between a general behavior pattern and an equivalent attitude measure.

In the present study, behavior was measured at two levels of generality, and attitude was measured at five levels of generality. We observed the relationship between each of the five attitude measures and each of the two behavior measures. As the five attitudes were found to be moderately interrelated, a multiple regression analysis was employed to estimate the independent effects of each and the combined additive effects of the attitudes on each of the two behavior measures.

B. METHOD

The hypothesis was tested on data collected by a questionnaire sent to 379 students selected randomly from the student directory at a middle-sized university. Two hundred twenty-one questionnaires were returned (59%).¹ Of those returned, 38 were incomplete and, consequently, were excluded from the analysis. Each questionnaire was accompanied by a cover letter briefly explaining the general nature of the research project and its sponsors, and assuring the respondents of anonymity.

¹ For sex, year in school, and major area of study we compared the parameters of the returned portion of the sample with the known parameters of the total university. They are approximately equal, suggesting the representativeness of the returned portion of the sample.

Behavior was measured in terms of 17 specific acts of examination coping behavior. The acts ranged from those considered to be deviant by a few respondents to those considered to be deviant by just about all the respondents. Specifically, the respondents were asked to report on a five-point scale the extent to which they committed each of the 17 acts during the last semester: 1 (don't remember), 2 (never), 3 (once), 4 (twice), 5 (three or more times). For nine of the 17 specific acts, most of the respondents fell into the "never" category. Consequently, this analysis is restricted to those eight acts where the response distribution tended to approximate normality, as follows: B₁, got help on a take home examination from another student; B₂, got help on a term paper from another student; B₃, used the same term paper in two or more classes; B₄, took ideas from other published works and presented them in a term paper without acknowledging the original source; B₅, secured a copy of an old examination; B₆, talked about the contents of a forthcoming examination to another student who had already taken either the course or the same examination in an earlier section; B₇, lied to an instructor in order to take an examination late; B₈, copied from another person's paper on an in-class examination.

A general measure of examination coping behavior was constructed by summing the scores for the eight specific acts. The correlations between the acts ranged from .04 to .36 with a mean of .12. This is consistent with other work (3) suggesting that while a limited general moral dimension may be abstracted, for the most part moral behavior is situational in nature. Yet, to some extent even the moderately low interrelationships between the specific acts suggest that the total score may be viewed as measuring an underlying examination coping orientation. Inspection of the specific acts suggests that the total score may be viewed as reflecting the extent to which students use others in preparing for and taking examinations.

Concerning the validity of the behavior index, recently there has emerged a concern as to the validity of questionnaire measures of behavior (6). For the most part the research tends to show that behavior intentions are not a good measure of actual future behavior; on the other hand, there is a growing body of evidence from a variety of research areas showing that self-reports of past behavior show a reasonably high degree of validity as a measure of actual behavior (4, 5, 14, 15). However, more important than the absolute discrepancy between the self-report and actual behavior is the extent to which that discrepancy affects the independent-dependent variable relationships. Concerning this problem Tittle and Hill (14) have re-

ported that of the students who were asked whether or not they voted in the last school election, official records revealed that 11% lied; however, the mean relationship (gamma correlation) between (a) five different attitude scales and the recorded vote and (b) the same five attitude scales and the self-report measure of voting only differed by .056. If we can assume a similar low rate of invalidity in our scales and a corresponding effect on the variable relationships, such would not affect our conclusions. That is, while the level of index invalidity may affect the absolute strength of the attitude-behavior relationship, it should not affect the *relative* strength of the relationship as affected by the degree of generality equivalence between attitude and behavior objects, which is the major question of this paper.

To maximize further the validity of the self-report measure employed, we designed the study format to minimize problems of memory distortion and social desirability. Concerning the former, the questionnaire was mailed at the beginning of the Spring semester, and the respondents were instructed to limit their responses to just the previous semester's activities. As to the latter, rather than classroom distribution, the questionnaires were sent to the respondents' campus homes, allowing the questionnaires to be completed in private. Also, in the introductory letter we emphasized that the respondents should not sign their names, and that there was no possible method of establishing their identity.

Attitudes were measured at five levels of generality. At the most specific level, attitudes toward the 17 examination coping patterns were measured. Specifically, the respondents were asked to indicate the extent (strong approval, approval, undecided, mild disapproval, and strong disapproval) to which they approved or disapproved of each of the 17 specific acts. For a somewhat more general attitude measure, the scores for the eight acts used in the composition of the general behavior scale were summated. The internal consistency (α .79) of the general attitude scale indicates that the scale is more than an aggregate of unrelated attitude items, but tends to measure an underlying general attitude. Similar to the general behavior orientation scale, inspection of the items suggests that the total score reflects the extent to which respondents approved of using others in preparing for and taking examinations.

As a more general attitude object, attitude toward general college cheating was measured. College cheating was selected, as each of the eight specific acts of examination coping to various degrees may be defined as cheating. The scale, containing five items originally developed by Bowers (2),

showed an alpha of .78. Respondents were asked the extent to which they agreed (agree strongly, agree mildly, not sure, disagree mildly, and disagree strongly) with each of the statements about cheating.

As extremely general attitude objects, attitudes toward intellectualism and honesty in interpersonal relations were measured. Intellectualism and honesty in interpersonal relations were selected as attitude objects, as it seemed reasonable to hypothesize that those who approved of intellectualism or honesty would be less prone to employ any of the coping techniques. The intellectual scale, consisting of five items originally developed by Scott (13), showed an alpha of .66. Specifically, the respondents were asked to indicate the extent to which they admired (always admire, depends on the situation, always dislike) in other people various forms of intellectualism. The honesty scale, consisting of three items also originally developed by Scott (13), showed an alpha of .66. Specifically, the respondents were asked to indicate the extent to which they admired (always admire, depends on the situation, always dislike) in other people various forms of honesty in interpersonal relations.

To reiterate, in terms of the context of this study, the generality equivalency hypothesis suggests the following: the relationships between each of the eight specific coping patterns and the relevant specific attitude should be greater than the relationships between each of the eight specific coping patterns and the more general attitudes; however, for the general behavior measure of the use of others in preparing for and taking examinations, we expect the more general attitudes to be the best predictors, particularly the attitude measured at the equivalent level of generality.

C. RESULTS

We will first consider the specific patterns of examination coping. The results are presented in Table 1. In the upper half of the table for the first eight columns the coefficients in rows 2 to 5 describe the bivariate relationships between each of the four general attitudes and each of the eight specific coping patterns; coefficients in row 1 describe the bivariate relationships between each specific coping pattern and the relevant specific attitude; and the figures in the ninth column describe the mean bivariate relationships calculated across the eight specific coping patterns. In the same order of presentation, the partial regression coefficients are presented in the lower half of the table.

The bivariate coefficients suggest that the degree and statistical significance of the attitude-behavior relationship depends on the level of attitude

TABLE 1
ZERO ORDER CORRELATIONS AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS BETWEEN
EIGHT SPECIFIC MEASURES OF EXAMINATION COPING AND FIVE ATTITUDES

Attitude	Examination coping behavior ^a								Mean
	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	B ₈	
	<i>Zero order correlations</i>								
Relevant specific attitude	.28**	.34**	.21**	.30**	.43**	.38**	.30**	.39**	.33
General attitude—coping	.14	.27**	.08	.15*	.35**	.33**	.20**	.22**	.22
General attitude—college cheating	—06	.16*	.05	.00	.14*	.10	.17*	.17*	.09
General attitude—intellectualism	—08	.05	.00	.10	—09	.03	—03	.00	.00
General attitude—honesty	—04	—10	—03	—05	—04	.01	.04	.10	—02
	<i>Standardized partial regression coefficients</i>								
Relevant specific attitude	.34**	.29**	.31**	.32**	.36**	.24**	.26**	.37**	.31
General attitude—coping	—00	.02	—15	.00	.12	.19	.07	.07	.04
General attitude—college cheating	—18*	.09	.06	—08	—02	—04	.01	.02	—02
General attitude—intellectualism	—13	.04	—02	.11	—12	—01	—04	.00	—02
General attitude—honesty	.00	—07	—01	—09	.00	.04	—01	—10	—03

^a See text (Method section) for definitions of eight coping behaviors.

* Significant at .05 level.

** Significant at .01 level.

generality. As the measure of attitude increased in generality, the degree and statistical significance of the relationship decreased. However, the moderate relationships between the various attitudes measured at different levels of generality create a problem in estimating the independent effects of each attitude level on the specific patterns of examination coping and the general pattern of examination coping. To estimate the independent effects of each attitude level on each of the specific coping patterns, partial regression coefficients were computed between each of the specific coping patterns and each of the five attitude generality levels.

The results (see lower half of Table 1) accentuate the conclusion drawn in the bivariate analysis: only relevant specific attitudes possessed a substantial independent effect on specific examination coping patterns. Controlling for the four general attitudes did not affect the relationship between each of the specific coping patterns and the relevant specific attitude. The mean partial regression coefficient for the relevant specific attitudes was .31, and all of the coefficients were significant at the .01 level, compared to the mean zero order coefficient of .33. However, the relationship between each of the specific coping patterns and the attitude toward general examination coping was severely reduced when the relevant specific attitude and the three other general attitudes were controlled. The mean partial regression coefficient dropped to .04, and none of the eight coefficients was significant at the .05 level, compared to a mean zero order coefficient of .22. The mean partial regression coefficients between the specific coping patterns and the other three general attitudes were also quite low, although not too different from the low mean zero order coefficients. For attitude toward general college cheating the mean partial regression coefficient was —.02 (compared to a mean zero order coefficient of .09); for attitude toward general honesty it was —.03 (compared to a mean zero order coefficient of —.02); and for attitude toward intellectualism it was —.02 (compared to a mean zero order coefficient of .00).

The failure of the more general attitudes to manifest an independent effect was also observed by examination of the multiple correlations in a stepwise fashion. The mean zero order correlation between the specific attitudes and the relevant specific behaviors was .33. Adding the four more general attitudes to the regression equations increased the mean multiple correlation to only .35.

Hence, while the attitudes measured explained only a small proportion of the total variation in the specific patterns of examination coping behavior, the vast portion of the explained variance was explained by the specific relevant attitude.

Consider now the prediction of general behavior patterns: that is, commonalities in behavior across situational contingencies, which in this case refers to the general use of others in preparing for and taking examinations. The bivariate correlations support the equivalency hypothesis, suggesting that the general attitude toward the use of others is the best predictor of the general use of others in examination coping. However, because of the moderate relationships between the various attitude measures, to estimate more accurately the relative independent effect of each level of attitude generality on the general pattern of examination coping, we computed the partial regression coefficients between the general measure of examination coping and each of the four general attitudes, controlling for the other three general attitudes. The partial regression coefficient for the attitude toward the general use of others was .47 (significant at the .01 level and equivalent to the zero order coefficient); the partial regression coefficient for the attitude toward general college cheating was $-.02$ (compared to a zero order coefficient of .20); the partial regression coefficient for the attitude toward general intellectualism was $-.03$ (compared to a zero order coefficient of .01); and the partial regression coefficient for the attitude toward general honesty was $-.05$ (compared to a zero order coefficient of .05). Furthermore, adding any one of the specific attitudes to the regression equation did not substantially change the partial regression coefficients of the other more general attitudes; and when the four more general attitudes were controlled, the mean partial regression coefficient for the specific attitudes was zero (range: .11 to $-.14$).

Hence, it seems safe to conclude that the general behavioral orientation toward using others in examination coping is best predicted by an equivalent attitude (attitude toward the general use of others), and the level of predictability is substantially reduced as the level of attitude generality either decreases or increases. This general conclusion is also observed by examining the multiple correlations in a stepwise fashion. The zero order correlation for the attitude toward the general use of others was .47. Adding attitudes toward college cheating, honesty, and intellectualism to the regression equation increased the multiple correlation to only .48, and adding any one of the specific attitudes to the regression equation did not change the multiple correlation.

The significance of the strong independent relationship between the general attitude and behavior measures of coping is further accentuated by the low relationship between the general attitude toward examination coping and each specific coping pattern. Controlling for the other four general attitudes and the relevant specific attitude resulted in a mean partial regres-

sion coefficient of only $-.04$. Hence, while the attitude toward the general use of others in examination coping is a poor predictor of specific patterns of the use of others in examination coping, it is a reasonably good predictor of general commonalities of examination coping, explaining 22% of the variance.

D. DISCUSSION

The relationship between attitude and behavior was examined at five different levels of attitude generality and two different levels of behavior generality. To estimate the independent effects of each attitude, standardized partial regression coefficients were computed. For specific measures of behavior the analysis reveals that only the relevant specific attitude possessed an independent effect, and for the general measure of examination coping behavior the analysis reveals that of the four general attitudes, only the generality equivalent attitude (attitude toward the general use of examination coping) showed a significant independent effect.

Before further discussing the relevance of this research to the attitude-behavior consistency issue, we will first consider the plausibility of accounting for the findings in terms of differential reliability. Two measures of reliability are considered: number of items constituting the attitude scale and the internal consistency between the items. In terms of reliability alone we would have predicted that the multiple item scales of highest internal consistency would possess the highest predictive potential. Yet, the strongest predictors of the eight specific coping patterns were the relevant single item attitude measures. Hence, it may well be that the differential reliability between the attitude scales worked against confirming the hypothesis. If the specific attitude indexes had been multiple item scales showing high internal consistency, perhaps the relationship between the specific attitudes and the appropriate specific coping patterns would have been higher.

The results concerning the differential prediction of behavior commonalities in examination coping also cannot be explained in terms of differential reliability. For the internal consistency of the general examination coping attitude scale ($\alpha = .79$) was not significantly different from the internal consistency of the other three general attitude scales. The college cheating attitude scale showed an α of $.78$; the honesty attitude scale showed an α of $.66$; and the general intellectualism attitude scale showed an α of $.62$.

Hence, it seems reasonable to conclude that the data support the object generality equivalency hypothesis that the relationship between attitude and

behavior depends on the level of generality equivalence between the attitude and behavior objects. In evaluating these results we must bear in mind that even at an equivalent level of generality, attitude still only explains a small proportion of the total behavior variance. The mean partial regression coefficient for specific attitude as a predictor of specific behavior was .31, and the partial regression coefficient for the attitude toward general coping as a predictor of a general pattern of coping was .47. However, we must consider these results within this particular context of research. Reviewing the literature, Wicker (16) has concluded that product-moment correlations relating attitude to behavior are rarely above .30 and often are near zero. Hence, in terms of past work, the findings of this study are relatively significant. While they do not preclude the need to include other variables in a behavior prediction equation, they do suggest that if measured at an equivalent level of generality, attitude can play a significant role in predicting behavior.

In explaining this relationship, the concept of attitude-behavior relevance seems to be of critical importance. For as the attitude object increases in generality, its behavior implications appear to become increasingly diffuse and ambiguous. It becomes minimally relevant to a large number of specific behaviors, but not maximally relevant to any one of them. Thus, while a general attitude may not strongly affect the behavioral expression of any one specific behavior pattern, its minimal effect on a variety of such patterns makes it very relevant in predicting intersituational commonalities in behavior.

Combining this work with the recent work of Ajzen and Fishbein (1), Wicker (17), and Rokeach and Kliejunas (12) on the relative impact of attitude toward the object of behavior and attitude toward the behavior, we can conclude that the impact of attitude on behavior is maximal when (a) the object of attitude is behavior itself (rather than the object of that behavior), and (b) attitude and behavior are measured at an equivalent level of generality. A review of the literature (9, 16) reveals that these conditions are infrequently met. In fact the exact opposite conditions tend to prevail: attitude toward a general object of behavior is generally used to predict a specific pattern of behavior.

REFERENCES

1. AJZEN, I., & FISHBEIN, M. The prediction of behavior from attitudinal and normative variables. *J. Exper. Soc. Psychol.*, 1970, 6, 466-487.
2. BOWERS, W. Student Dishonesty and Its Control in College. New York: Bur. Appl. Soc. Res., 1964.

3. BURTON, R. V. The generality of honesty reconsidered. *Psychol. Rev.*, 1963, **70**, 481-499.
4. CAHALAN, D. Correlates of respondent accuracy in the Denver validity study. *Public Opin. Quart.*, 1968, **32**, 607-622.
5. CLARK, J., & TIFFT, L. Polygraph and interview validation of self-report deviant behavior. *Amer. Sociolog. Rev.*, 1966, **31**, 516-523.
6. DEUTSCHER, I. Words and deeds: Social science and social policy. *Soc. Problems*, 1966, **13**, 235-254.
7. FISHBEIN, M. The relationships between beliefs, attitudes, and behavior. In S. Feldman (Ed.), *Cognitive Consistency*. New York: Academic Press, 1966.
8. LAPIERE, R. T. Attitudes vs. actions. *Soc. Forces*, 1934, **13**, 230-237.
9. LISKA, A. E. The Impact of Attitudes on Behavior: The Consistency Controversy. Cambridge, Mass.: Schenkman, 1974.
10. ———. Impact of attitude on behavior: Attitude-social support interaction. *Pacific Sociolog. Rev.*, 1974, **17**, in press.
11. ROKEACH, M. Beliefs, Attitudes and Values. San Francisco: Jossey-Bass, 1968.
12. ROKEACH, M., & KLEJUNAS, P. Behavior as a function of attitude-toward-object and attitude-toward-situation. *J. Personal. & Soc. Psychol.*, 1972, **22**, 194-201.
13. SCOTT, W. A. Values and Organizations. Chicago: Rand McNally, 1965.
14. TITTLE, C. R., & HILL, R. J. The accuracy of self-reported data and prediction of political activity. *Public Opin. Quart.*, 1967, **31**, 103-106.
15. WEISS, C. H. Validity of welfare mothers' interview responses. *Public Opin. Quart.*, 1968, **32**, 622-634.
16. WICKER, A. W. Attitudes versus action: The relationship of verbal and overt behavioral responses to attitude objects. *J. Soc. Issues*, 1969, **25**, 41-78.
17. ———. An examination of the "other variables" explanation of attitude behavior inconsistency. *J. Personal. & Soc. Psychol.*, 1971, **19**, 18-30.
18. WICKER, A. W., & POMAZAL, R. J. The relationship between attitude and behavior as a function of specificity of attitude object and presence of a significant person during assessment conditions. *Represent. Res. in Soc. Psychol.*, 1971, **2**, 26-31.

Department of Sociology

Central Michigan University

Mount Pleasant, Michigan 48858

COGNITIVE STRUCTURE AND PERFORMANCE ON CLASSROOM MATERIAL* ¹

University of Florida

FRANZ R. EPTING, DAVID I. SUCHMAN, AND ANN HOWLAND

SUMMARY

The purpose of this study is to assess the relationship between two aspects of cognitive structure (intensity and consistency) and performance on classroom material. Assessed by a modification of the Bannister and Fransella (5) grid method, intensity is defined in terms of the amount of differentiation in cognitive functioning. Consistency refers to the reproducibility of the cognitive structure. Classroom performance was evaluated by a behavior modification technique that yielded cumulative rates for approximately 20 performance sessions. As predicted, the low consistency students, when compared to the high consistency students, attained the higher rate correct; however, the low consistency students also achieved the higher incorrect rate. The intensity main effect failed to reach significance, and there was no interaction indicated.

A. INTRODUCTION

In personality research, the relationship between cognitive structure and learning has received some theoretical attention, and there have been a few empirical investigations (6, 8, 10, 15). The approach taken in the present study is to examine how learning occurring in a structured teaching situation may be affected by two aspects of cognitive structure: intensity and consistency. These two variables were formulated by Don Bannister and his colleagues in order to understand better and investigate empirically the cognitive functioning of persons diagnosed as thought disordered schizophrenics (1, 2, 4, 7). There is nothing in the general formulation of consistency and intensity, however, that prevents the use of these constructs in understanding the cognitive functioning of the "normal" person.

Recently there have been several studies examining both the general con-

* Received in the Editorial Office on October 24, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to express their appreciation to Gary Sarver for assisting with the data preparation and to the University of Florida Computing Center for computations of the grid scores.

struct validity of intensity and consistency and the instruments used to assess these constructs (9, 13, 16, 17). Although some areas needing further refinement were specified, Bannister (3) has recently pointed out that the general theory is capable of handling the modification. Modifications of Bannister's original definitions of consistency and intensity are used in the present study.

Intensity is defined in terms of the total number of interrelationships being manifested between constructs (7). In the study of schizophrenic thought disorder, intensity refers to the total amount of structure being manifested by a person: high intensity indicates a high degree of organization in the construct system, and low intensity relates to a lack of clear-cut conceptual structure (6). Applying this definition to the learning situation in a "normal population," we are proposing that intensity be taken to indicate the total amount of overlap between the different construct dimensions. High intensity would indicate a considerable amount of similarity in the constructs, while low intensity would indicate a number of independent or unrelated meaning dimensions. It might be expected that the person with low intensity scores would have some advantage in the learning situation, compared to the high intensity person, since he would have a greater variety of dimensions available to him in order to process the new information.

Consistency refers to the reproduction of the cognitive structure. With respect to schizophrenic thought disorder, high consistency implies a large amount of stability and generalizability in the construct system, while low consistency seems to indicate little stability in the system (6). When this definition is applied to the learning situation, it might be expected that the person who demonstrates low consistency is indicating change or the process of change in the construct system, while the person receiving a high consistency score is indicating considerable stability and therefore little change in the system. Since the learning of new information is generally defined in terms of change (modification of a response to a stimulus), the high rate of learning might be expected to accompany the lower consistency scores.

B. METHOD

From a class of 156 students taking an introductory course in personality, 108 volunteered for the study, and 96 completed all the testing material. The performance of these 96 students and that of the entire class was evaluated by a behavior modification technique developed by Johnston and Penny-packer (11). This "precision teaching" program involved assigning students

in the course to other students who served as their teaching assistants. The teaching assistants had completed the course in previous quarters.

The students had approximately 20 performance sessions during the quarter, occurring in biweekly or triweekly meetings with their teaching assistants, where they covered the material of the week's lectures and readings. During these sessions the students were timed as they answered fill-in questions presented in a flip-card format. The number of correct responses and the number of incorrect responses were each divided by the time of the whole performance session to determine the rate correct and the rate incorrect for that session. Performance for each day was then recorded, and the rates correct and incorrect were added to the rates for all the previous sessions and displayed on a graph. On each student's graph the criterion line for a grade of "A" was displayed for rate of both correct and incorrect responses. The summation of the rates correct and incorrect for all the sessions provided the student with his total cumulative rates. These cumulative rates served as the dependent variables in the present investigation.

The intensity and consistency of the students were assessed by means of a modified form of the Bannister and Fransella (5) grid which was individually administered to students during a performance session. The test consisted of rank ordering eight people (self, mother, father, best opposite sex friend, best same sex friend, person who makes you comfortable, person difficult to understand, and a disliked acquaintance) on six constructs: kind, stupid, selfish, sincere, mean, and honest. The rankings were from 1 to 8, where 1 was the person "most kind . . . honest . . . stupid, etc." and 8 was the person who least characterized this description. A retest was administered immediately after the first administration.

Intensity scores were obtained by performing a Spearman rank order correlation (Rho) between all possible pairs of constructs on the first test and all possible pairs on the second administration of the test (5). The result was 15 rank order correlations for each administration which were then squared and multiplied by 100 to give "percentage variance in common" scores. These scores were totaled to give the total intensity index for the subject. High scores indicate that the subject was rank ordering as if the qualities are overlapping and related. Low scores indicate that he was treating the dimensions relatively independently.

Consistency measure was obtained by rank ordering the 15 relationship scores of the first test from the highest positive through zero to the highest negative. The same rank ordering was then performed for the second test,

and a Spearman rank order correlation coefficient was calculated for the two sets of rankings. This correlation indicated the extent to which the subject preserved the pattern of relationships between these constructs from the first test administration to the second. This is a type of test-retest correlation.

C. RESULTS AND DISCUSSION

The population was divided at the median on both intensity (1385.40) and consistency (.87). A 2×2 analysis of variance with use of the harmonic mean solution for unequal cell frequencies was performed on the cumulative rates. As predicted, the main effect for consistency was significant for the cumulative rate correct ($F_{1, 92} = 5.14, p < .05$), and the means for low and high consistency, respectively, were 77.59 and 71.06. Contrary to expectation, the intensity main effect failed to reach significance, and there was no interaction between intensity and consistency.

The finding that the low consistency students achieved a higher cumulative correct response rate is consistent with the interpretation that the consistency score is indicative of a general modification of the cognitive structure in assimilating new information. However, further examination of the data revealed that the consistency main effect was also significant for the cumulative rate incorrect ($F_{1, 92} = 8.061, p < .01$). The means for high and low consistency, respectively, were 5.98 and 7.19. The main effect for intensity was not significant, and there was no interaction. Thus the low consistent students attained a higher total rate of response, both correct and incorrect, than the high consistency students. One possible interpretation of this finding is that the low consistency students, lacking a stable and generalized structure, were receiving some type of validation by being placed in this highly structured behavior modification teaching program. Admittedly, further research is needed in order to explore this and alternative interpretations of these results.

It is not readily apparent why the intensity scores had no effect on performance. It has been suggested that high intensity scores, evidenced by considerable overlap between construct dimensions, may be indicating a high amount of integration of different dimensions instead of simply a lack of differentiation (12, 14). The highly structured teaching situation employed here could also have influenced the performance of high and low intensity students in such a way that low intensity students were employing more dimensions than were appropriate in a very concrete and simplified learning situation.

While admittedly not demonstrating a relationship between cognitive structure and learning (high correct/low incorrect response rate), this study has demonstrated a relationship between cognitive structure and a type of performance in a structured teaching situation. In this way it has provided a demonstration of the relationship between this approach to cognitive structure and one set of problems in the general domain of educational experiences.

REFERENCES

1. BANNISTER, D. Conceptual structure in thought-disordered schizophrenics. *J. Ment. Sci.*, 1960, **106**, 1230-1249.
2. ———. The nature and measurement of schizophrenic thought disorder. *J. Ment. Sci.*, 1962, **108**, 825-842.
3. ———. Critiques of the concept of "loose construing": A reply (with a comment by C. D. Frith & F. J. Lillie). *Brit. J. Soc. & Clin. Psychol.*, 1972, **11**, 412-414.
4. BANNISTER, D., & FRANSELLA, F. A grid test of schizophrenic thought disorder. *Brit. J. Soc. & Clin. Psychol.*, 1966, **5**, 95-102.
5. ———. Manual for the Grid Test of Schizophrenic Thought Disorder. Barnstable, Eng.: Psychol. Test Publ., 1967.
6. BANNISTER, D., & MAIR, J. M. M. The Evaluation of Personal Constructs. London & New York: Academic Press, 1968.
7. BANNISTER, D., FRANSELLA, F., & AGNEW, J. Characteristics and validity of the grid test of thought disorder. *Brit. J. Soc. & Clin. Psychol.*, 1971, **10**, 144-151.
8. CROCKETT, W. H. Cognitive complexity and impression formation. In B. A. Maher (Ed.), *Progress in Experimental Personality Research*. London & New York: Academic Press, 1965.
9. FRITH, C. D., & LILLIE, F. J. Why does the Repertory Grid Test indicate thought disorder? *Brit. J. Soc. & Clin. Psychol.*, 1972, **11**, 73-78.
10. HARVEY, O. J., PRATHER, M., WHITE, B. J., & HOFFMEISTER, J. K. Teacher's beliefs, classroom atmosphere, and student behavior. *Amer. Educ. Res. J.*, 1968, **5**, 151-166.
11. JOHNSTON, J., & PENNYPACKER, H. A behavioral approach to college teaching. *Amer. Psychol.*, 1971, **26**, 219-244.
12. LANGLEY, C. W. Differentiation and integration of systems of personal constructs. *J. Personal.*, 1971, **39**, 10-25.
13. MCFAYDEN, M., & FOULDS, G. A. Comparison of provided and elicited grid content in the Grid Test of Schizophrenic Thought Disorder. *Brit. J. Psychiat.*, 1972, **121**, 53-57.
14. NORRIS, F. M., JONES, H. G., & NORRIS, H. Articulation of the conceptual structure in obsessional neuroses. *Brit. J. Soc. & Clin. Psychol.*, 1970, **9**, 264-274.
15. SCHRODER, H. M., DRIVER, M. J., & STREUFERT, S. Human Information Processing. New York: Holt, Rinehart & Winston, 1967.
16. SLATER, P. The measurement of consistency in repertory grids. *Brit. J. Psychiat.*, 1972, **121**, 45-51.
17. WILLIAMS, E. The effect of varying elements in the Bannister Fransella Grid Test of Thought Disorder. *Brit. J. Psychiat.*, 1971, **119**, 207-212.

Department of Psychology
University of Florida
Gainesville, Florida 32611

JUDGED SERIOUSNESS OF WATERGATE-RELATED CRIMES* 1

University of Maryland

ROBERT M. CARROLL, STEVEN M. PINE, CINDY J. CLINE,
AND BRUCE R. KLEINHANS

SUMMARY

The judged seriousness of 19 crimes was scaled by Thurstone in 1927 and again by Coombs in 1966. The present study once again repeated the method of the Thurstone study with a comparable population, but with the addition of seven crimes directly related to the Watergate incident. The major findings were as follows: (a) Sex offenses have continued to decrease in judged seriousness since 1966. (b) The seven Watergate related offenses added by this study were exceeded in judged seriousness only by those crimes that involved direct personal threat.

A. INTRODUCTION

To demonstrate the usefulness of his law of comparative judgments (3), Thurstone in 1927 used University of Chicago students to measure the judged seriousness of 19 crimes and offenses (4). Forty years later, Coombs (1) replicated the study using the same method, instructions, and crimes on University of Michigan students. The scales derived by Thurstone and Coombs are shown in Figure 1.

The present study re-evaluated the judged seriousness of these same crimes with the addition of seven crimes directly related to the Watergate incident. The purpose of this study was to measure the judged relative seriousness of the Watergate crimes and to note any changes in judged seriousness among the original 19 crimes.

B. METHOD

1. Stimuli

The stimuli used consisted of the 19 crimes used in the Coombs (1) and Thurstone (4) studies, shown in Figure 1, and the following seven Watergate

* Received in the Editorial Office on October 25, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research originated as a class project in a course on attitude measurement. The authors would like to thank Tim Chumley, Olivia Hale, Richard Mazie, Patrick Moran, and Andrew Novick for assistance in collecting the data.

related crimes designated WG-1 through WG-7: WG-1, Falsifying government documents; WG-2, Failure of authorities to investigate crimes; WG-3, Unconstitutional use of executive privilege; WG-4, Destroying criminal evidence; WG-5, Bribery of criminal defendants; WG-6, Illegal wiretapping; WG-7, Illegal use of campaign funds.

2. Instructions

The instructions to the Ss in this study were essentially the same as those used in the Thurstone (4) and Coombs (1) studies except that answer sheets were used instead of having Ss respond on the questionnaires. The Ss were given a questionnaire consisting of the instructions, a list of crime definitions, and 325 pairs of crimes (26 taken two at a time). For each pair of crimes, the Ss were instructed to indicate which of the two he/she judged to be the more serious.

3. Scale Construction

Thurstone's (3) law of comparative judgments, Case V, was used to develop the scale. This method provides a means for arranging a set of stimuli along a scale of measurement by observing the outcomes of paired comparisons carried out between all possible pairs of the stimuli.

4. Subjects

Data were collected during June and July of 1973 from 224 University of Maryland undergraduates. All were unpaid volunteers; however, most received course credit for participation. Twelve Ss had not marked the appropriate spaces on their answer sheets and were therefore excluded from the analyses.

C. RESULTS

The number of intransitive triples (circular triads) in each S's pair comparisons was an indication of response consistency (2). If responses were made on a random basis, the number of intransitivities expected would have

been $(1/4) \binom{n}{3} = 650$, with a variance of $(3/16) \binom{n}{3} = 488$. The obtained distribution of intransitivities had a mean of 90.2, clearly many standard deviations away from what would be expected with random responses.

Figure 1 gives the derived scale for the present study, as well as the scales

from the Coombs 1966 study and the Thurstone 1927 study.² Crimes are spaced within each scale to indicate their relative seriousness. Numerical scale values, arbitrarily equated at zero and 100 for the two extremes, appear adjacent to each crime. The Watergate crimes are denoted by the labels previously assigned (e. g., WG-1).

D. DISCUSSION

1. Overview

The results of this study should in no way be interpreted as a test of the Ss' legal knowledge; only their judgments of the seriousness of the given crimes were being measured. Furthermore, the results were based on a rather narrow sample of college students and are not necessarily representative of the attitudes of the general public. Since the origin and the unit of measurement for each scale were arbitrary, only relative positions are meaningful. For example, homicide in 1927 and in 1966 cannot legitimately be compared on the basis of absolute scale values. Instead, it should be noted how homicide changed with respect to the other crimes from 1927 to 1966.

Figure 1 shows that there is close agreement between the present study and the 1966 study. A glance at the extremes for these scales shows that the five most serious crimes and the two least serious crimes are in the same relative positions. This agreement demonstrates substantial reliability of the methodology, since the judged seriousness of these extreme crimes would not have been expected to change too drastically in seven years. It also speaks well for Thurstone's method that the inclusion of new stimuli did not seem to affect seriously the relative scale values assigned the original stimuli. Of the extreme crimes scaled in 1927 only vagrancy is in the same relative position as on the 1966 and 1973 scales. It appears that the judged seriousness of crimes underwent substantial change between 1927 and 1966, whereas between 1966 and 1973 the changes were confined to the nonextreme crimes.

2. Sex Crimes

One clear trend between the three scales is that sex crimes (rape, seduction, abortion, and adultery) have decreased markedly in judged seriousness over the years. In 1927 rape was judged to be the most serious crime, followed by homicide, but in 1966 the order was reversed. Furthermore, in 1927 seduction, abortion, and adultery were all judged to be more serious

² The authors would like to thank Professor Clyde H. Coombs and the American Psychological Association for permission to reproduce the 1927 and 1966 scales (1).

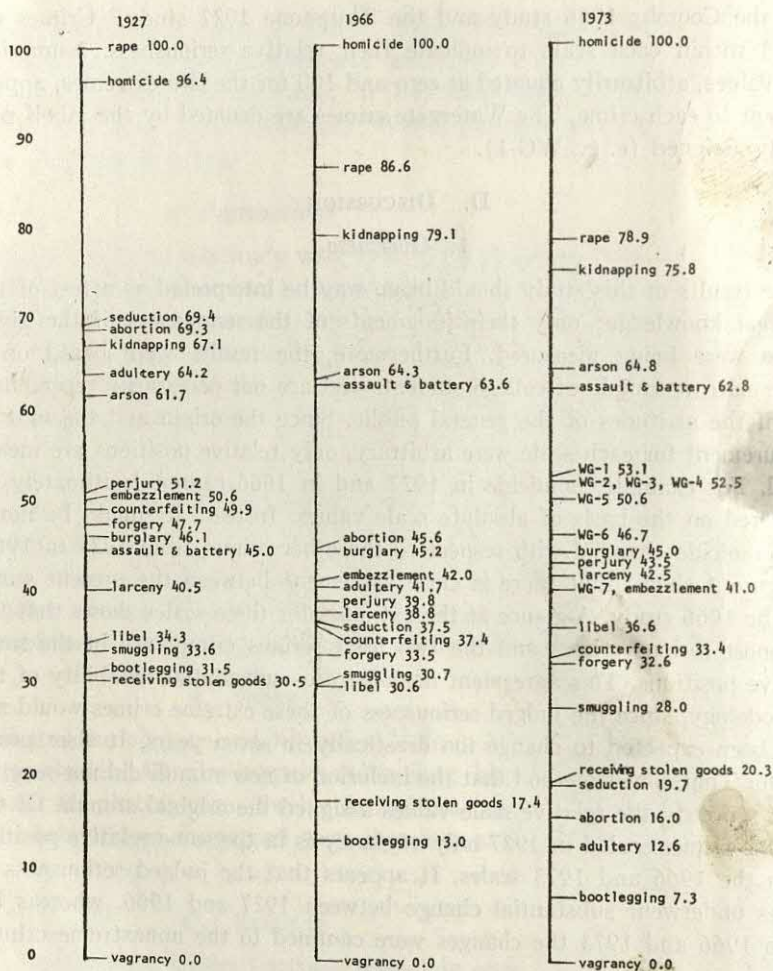


FIGURE 1
SCALES FOR CRIMES

Data for 1927 and 1966 are reproduced from C. H. Coombs, "Thurstone's measurement of social values revisited forty years later." *J. Personal. & Soc. Psychol.*, 1967, 6, 85-91 (Table 2, p. 87). Copyright 1967 by the American Psychological Association. Reprinted by permission.

than arson, whereas in 1966 all three fell below arson. Even more revealing is the finding that in the last seven years these same three crimes have fallen close to the bottom of the scale. Apparently, college students' attitudes

toward sex crimes have changed even more during the last seven years than during the previous 40 years.

3. *Watergate Crimes*

In the present study the Watergate related crimes appear in the middle of the scale and are closely grouped together. It can be noticed that perjury, larceny, and libel, which are also Watergate related crimes, increased in relative judged seriousness from 1966 to 1973. The scale indicates that only five crimes were judged to be more serious than the Watergate related crimes: namely, homicide, rape, kidnapping, arson, and assault and battery. Therefore, it can be concluded that the Ss of this study viewed the Watergate crimes to be serious, but not as serious as a crime that might involve substantial personal injury.

REFERENCES

1. COOMBS, C. H. Thurstone's measurement of social values revisited forty years later. *J. Personal. & Soc. Psychol.*, 1967, **6**, 85-91.
2. KENDALL, M. G. Rank correlation methods (2nd ed.). New York: Hafner, 1955.
3. THURSTONE, L. L. A law of comparative judgment. *Psychol. Rev.*, 1927, **34**, 273-286.
4. THURSTONE, L. L. Method of paired comparisons for social values. *J. Abn. & Soc. Psychol.*, 1927, **21**, 384-400.

Department of Psychology
University of Maryland
College Park, Maryland 20742

RESPONSE BIAS IN THE STATE-TRAIT ANXIETY INVENTORY: DETECTING THE EXAGGERATION OF STRESS*¹

*Aviation Psychology Laboratory, Civil Aeromedical Institute,
Federal Aviation Administration*

ROGER C. SMITH

SUMMARY

The State-Trait Anxiety Inventory (STAI) was administered on two occasions to 283 Ss, first with standard instructions and then with instructions to exaggerate the appearance of stress. Mean scores on both scales of the STAI were higher after the "fake bad," than after the standard instructions. Scores from subsets of items were found to discriminate effectively between authentic and simulated records; however, the most efficient classification of records was obtained with use of raw scores from the A-State scale. If any record with a score of over 48 was considered "stress-simulated," 95.7% of the records were classified correctly. The implications of these findings for use of the STAI were discussed.

A. INTRODUCTION

The State-Trait Anxiety Inventory (STAI) was developed by Spielberger, Gorsuch, and Lushene (5) to measure transitory anxiety (A-State) and anxiety proneness (A-Trait). While the STAI has proved useful in assessing A-State and A-Trait in a wide variety of circumstances, the demand characteristics of certain situations might motivate respondents to exaggerate anxiety. For example, individuals engaged in high-demand professions (e. g., law enforcement, air traffic control, etc.) might be inclined to overemphasize the impact of job-related stress in their responses to the STAI. Such biases would be of particular concern if data from the STAI were used to influence decision-making regarding working conditions, special incentives, or compensation. The purposes of this investigation were, first, to determine to what extent STAI scores are influenced by respondents' attempts to "fake bad"

* Received in the Editorial Office on October 29, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The author is especially indebted to Charles D. Spielberger for his criticisms and assistance in the preparation and revision of this manuscript.

in their anxiety responses and, second, to establish procedures for identifying STAI protocols biased by such tendencies.

B. METHOD

The STAI was administered on two occasions to 283 paid student volunteers (200 males, 83 females) recruited primarily from the University of Oklahoma. The first administration was with standard instructions; i. e., the respondents were asked to rate the 20 A-State and the 20 A-Trait items according to their current and general feelings, respectively. For the A-State scale, the four response categories varied from "not at all" to "very much"; for the A-Trait scale the rating categories ranged from "almost never" to "almost always." The Ss were *not* told that a second administration of the STAI was planned.

After a two to three minute break following completion of the first STAI, the Ss were given the STAI a second time. For the second administration, 131 Ss were asked to respond as would an employee who wanted to make it appear he was in an extremely stressful job (Simulation group). The remaining 152 Ss were given similar instructions, but in addition, they were instructed to "try to prevent the examiner from knowing that you are exaggerating your responses" (Concealed Simulation group). The Ss did not have access to their first STAI records during the second STAI administration.

C. RESULTS

Five Ss from the first group and six Ss from the second group either did not understand the instructions or were unable to complete the task as directed. These Ss were subsequently eliminated from the sample.

As expected, the STAI scores obtained under normal conditions were much lower than those obtained following the simulation instructions (Table 1). The stress-simulated scores were somewhat higher for Ss in the Simulation group, who were told to exaggerate indications of stress, than for the Concealed Simulation group, who were explicitly instructed to conceal their attempts to exaggerate the appearance of anxiety in their responses. In the comparison of the effects of simulation of stress on the A-State and A-Trait scales it was found that scores on the A-State measure increased more under the instructions to "fake bad" than did the A-Trait scores. The difference of the differences was significant, $t(270) = 10.02$, $p < .001$. There were no significant differences between males and females under standard and simulated conditions for either STAI scale. The data for males and females were therefore combined for all subsequent analyses.

TABLE 1
 MEAN A-STATE AND A-TRAIT RAW SCORES FOR AUTHENTIC STAI RECORDS
 (FIRST ADMINISTRATION) AND STAI RECORDS SIMULATED FOR STRESS
 UNDER BIAS AND CONCEALED-BIAS INSTRUCTIONS
 (SECOND ADMINISTRATION)

Group	A-State			A-Trait		
	Authentic	Simulated	<i>t</i>	Authentic	Simulated	<i>t</i>
Stress bias	34.02	69.78	33.13***	34.90	63.73	20.46***
Concealed						
stress bias	34.88	60.0	31.80***	36.52	56.08	22.01***
<i>t</i>	.95	12.62***		1.60	5.29***	

*** $p < .001$.

As a first step in discriminating between exaggerated and authentic STAI records, an item analysis was conducted to determine which items were influenced by the "fake bad" response set. A procedure that had been successfully applied to the identification of this type of response set in an affect adjective checklist was followed (4). This involved the determination of the percentage of *Ss* who rated each item in the direction of greater anxiety in the simulated record than in the authentic record. For all items a clear majority of *Ss* in both instructional groups reported higher anxiety ratings under the "fake bad" than the standard instructions. For the A-State scale, there were 10 items on which over 80% of the *Ss* showed increased ratings on simulated records. The mean percentage of *Ss* showing an increase across the 20 A-State items was 80.17 ($SD = 6.25$). For the A-Trait scale, there were seven items on which more than 80% of the *Ss* showed an increased anxiety rating on the exaggerated records. The mean percentage of *Ss* showing an increase on the 20 A-Trait items was 73.06 ($SD = 8.99$).

Combinations of scores from several subgroupings of items were analyzed with respect to their effectiveness in discriminating between authentic and stress-simulated protocols. Several different subsets of items were relatively efficient discriminators (e. g., all items on which over 80% of the *Ss* showed an increased score when exaggerating anxiety, the 10 items having the highest percentages of *Ss* showing an increase, etc.). However, the most efficient index was a combination of the scores from the four items with the highest percentages of *Ss* showing increased anxiety ratings under simulation (items 6, 10, 17, and 20). When records with a summed rating score of 10 or higher (the lowest anxiety rating for an item equaled a score of 1, the highest rating a score of 4) for the four items were designated as simulated, it resulted in the correct classification of 263 of 272 authentic records, and 246 of 272 simulated records, for an overall accuracy of 93.75%.

Although the four-item subset was an effective discriminator between authentic and simulated profiles, the use of the total scores from the STAI scales was even more effective in correctly identifying records in which anxiety had been exaggerated. The most efficient classification of records was obtained when raw scores of 48 or higher on the A-State scale were considered "stress-simulated" (Table 2). The overall hit rate with use of this score was 515 correct profile classifications out of 544 records (95.7%). Only 12 (4.4%) of the 272 authentic records were classified as simulated (false-positives), while 255 (93.8%) of the 272 stress-simulated scores were correctly identified. Of the biased scores, 120 (95.2%) of the 126 records from the Simulation group and 135 (92.5%) of the 146 records from the Concealed Simulation group were correctly classified as simulations.

The use of raw scores for discriminating between stress-simulated and authentic A-Trait records was not as successful as was the case with the A-State scale. It was possible, however, to achieve a reasonable hit rate with use of 47 as the cutting score (Table 2). This resulted in the correct classification of 483 of 544 profiles (88.8%). Of the 272 stress-simulated records, 235 (86.4%) were included by this score, while 24 of 272 (8.8%) authentic records were misclassified.

D. DISCUSSION

The findings indicate that STAI scores are quite susceptible to intentions to exaggerate stress effects, just as these scores are readily influenced by other response sets (e. g., 1). It is also clear that the STAI user can screen records for the "fake bad" type of bias with relatively little effort and with considerable effectiveness. While the application of this screening approach to other "normal" populations may not result in the same 95% hit rate attained with this experimental population, the normative data for "normal" student groups suggest that at worst the false-positive rate would probably not exceed 14% with use of raw scores. The overall effectiveness is also dependent upon the cutting score chosen by the user; however, it is possible to vary cutting scores across a considerable range to maximize correct identification of either authentic or stress-simulated protocols. For example, if the user can tolerate the loss of legitimate records by reduction of the cutting scores, it is possible to achieve 95% assurance that stress-simulated records will not be accepted as legitimate.

It should be emphasized, as with all such indices of response bias, that STAI records classified as stress-simulated on the basis of these procedures can only be considered as "suspect" records because there is relatively little

TABLE 2
A-STATE AND A-TRAIT CUMULATIVE RAW SCORE DISTRIBUTIONS FOR AUTHENTIC
AND TWO TYPES OF STRESS-SIMULATED RECORDS

Score	A-State				A-Trait			
	Authentic (<i>N</i> = 272)	Simulated (<i>N</i> = 126)	Concealed Simulation (<i>N</i> = 146)	Sum correct ^a (<i>N</i> = 544)	Authentic (<i>N</i> = 272)	Simulated (<i>N</i> = 126)	Concealed Simulation (<i>N</i> = 146)	Sum correct (<i>N</i> = 544)
65 or more	0	93	48	413	0	70	25	367
64	0	97	52	421	0	77	35	384
63	0	101	62	435	0	80	39	391
62	0	103	72	447	1	84	42	397
61	1	104	78	453	4	85	55	408
60	2	108	89	467	4	87	64	419
59	2	109	96	475	6	90	71	427
58	2	110	104	484	6	93	78	437
57	2	110	106	486	6	95	85	446
56	4	112	112	492	7	97	92	454
55	5	114	113	494	9	97	93	453
54	6	116	117	499	10	98	101	461
53	7	118	119	502	12	99	105	464
52	7	119	123	507	15	100	111	468
51	8	119	126	509	17	100	115	470
50	10	119	131	512	18	103	118	475
49	10	119	133	514	20	104	120	476
48	12	120	135	515	21	106	124	481
47	16	120	136	512	24	110	125	483
46	19	120	137	510	30	112	126	480
45	21	120	139	510	38	115	127	476
44	26	120	139	506	44	115	129	472
43	32	121	139	500	52	117	130	467
42	39	121	140	494	57	117	134	466
41	43	122	141	492	68	117	135	457
40	55	125	141	483	78	118	135	447

^a Number of records correctly classified if all scores at or above that level are designated as biased.

basis for discriminating between legitimate records reflecting intense anxiety and those biased by stress-simulation. Thus, while the procedure using raw scores may serve as an effective screen in "normal" populations, a perusal of the norms for the STAI (5) indicates that the false-positive rate is likely to be quite high if this approach is applied to other populations. For example, a cutting score of 48 for the A-State scale would result in false-positive rates of 52% for neuropsychiatric patients, 44% for prison inmates, and 36% for medical/surgical patients. Thus, for samples in which high anxiety may be common, the false-positive rate will be quite high when this screening procedure is used. Under circumstances where the false-positive rate is high, or where loss of authentic records cannot be tolerated, the screening procedure might serve as a "flag" to indicate the need for further evaluation of an individual's anxiety level.

In comparison to the hit rate for stress-simulation of 95% attained with the STAI, it was found that the most efficient index for the same stress-simulation bias in the Composite Mood Adjective Checklist (3) achieved 90% accuracy in classification of simulated and authentic records (4). The widely used F minus K index developed by Gough (2) for detecting simulation of psychopathology on the MMPI has a maximum overall hit rate of approximately 86%, with a limit of 88% accuracy in identifying biased records. Thus, it appears that the efficiency of the screening procedures for the STAI that are described in this study compares favorably with the efficiency of indices generally considered useful for identifying response biases.

REFERENCES

1. ALLEN, G. J. Effect of three conditions of administration on "trait" and "state" measures of anxiety. *J. Consult. & Clin. Psychol.*, 1970, **34**, 355-359.
2. GOUGH, H. G. The F minus K dissimulation index for the MMPI. *J. Consult. Psychol.*, 1950, **14**, 408-413.
3. MALMSTROM, E. J. Composite mood adjective checklist. Unpublished manuscript, University of California, Los Angeles, 1968.
4. SMITH, R. C. Affect adjective checklists and the assessment of psychological effects of stress: A study of response bias. *Proc. 79th Ann. Conven. APA*, 1971, **6**, 123-124.
5. SPIELBERGER, C. D., GORSUCH, R. L., & LUSHENE, R. E. Manual for the State-Trait Anxiety Inventory. Palo Alto, Calif.: Consult. Psychol. Press, 1970.

Aviation Psychology Laboratory
Civil Aeromedical Institute
FAA Aeronautical Center
P. O. Box 25082
Oklahoma City, Oklahoma 73125

STUDENT RATERS' REFERENTS IN RATING COLLEGE TEACHING EFFECTIVENESS*

University of South Florida

JOHN FOLLMAN, CAROLYN LAVELY, STUART SILVERMAN, AND
JOHN MERICA

SUMMARY

Referents used by college students in rating the teaching effectiveness of college professors were examined in two substudies. In Substudy 1, consisting of two classes, randomly assigned students rated against one of the following professor referents: Ideal, Best, Average, or Worst. In Substudy 2, consisting of two classes, randomly assigned students rated against the average of one of the following professor referents: High School Teachers, College and University Teachers, or All Teachers. High reliability estimates obtained in all 14 groups. There were no significant differences in level of ratings awarded to the different formats in either Substudy 1 or Substudy 2.

A. INTRODUCTION

The reason for this research was to investigate the effects of different instructor referents on the reliability and level of student ratings of college teacher and course effectiveness. In a basic research referent peer rating study de Jung (1) determined that lower ratings were associated with more explicit *vis à vis* less explicit frames of reference. Thus the objective of this research was to investigate the effects of seven different rating referents on reliability and level of ratings of college teachers.

B. PROCEDURE

Two instructors were rated in each of two substudies. In Substudy 1 the student raters rated their instructors against one of the following four formats: Ideal, Best, Average, Worst. In Substudy 2 the students rated their instructors against the average of one of the three following formats: High School Teachers, College and University Teachers, All Teachers. Three

* Received in the Editorial Office on November 7, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

instructors were used in toto, two sections of the same instructor being used, one in each substudy, for cross-study stability.

In Substudy 1 Ss were 63 students in a finance class and 82 students in a science class. In Substudy 2 Ss were 73 students in a finance class and 63 students in a communications class. All three classes were undergraduate level classes at the University of South Florida in June, 1973. All Ss within each class were randomly assigned to their respective treatment groups.

The rating scale used in both substudies was a conventional 22 item college course rating scale developed at the University of South Florida. Five rating categories were used, as follows: 5 (far above average), 4 (above average), 3 (average), 2 (below average), 1 (far below average). ANOVA group reliability estimates were determined for each rating sample. In addition, means, standard deviations, and ANOVAs were conducted for each instructor within both substudies.

C. RESULTS

Table 1 indicates the *N*s, ANOVA group reliability estimates, total score means and standard deviations, and total score means adjusted for the five

TABLE 1
N_S, RELIABILITY ESTIMATES, UNADJUSTED MEANS AND SD_S, AND ADJUSTED MEANS
FOR SEVEN TREATMENTS ACROSS TWO SUBSTUDIES

Instructor referent	<i>N</i>	Reliability	\bar{X}	<i>SD</i>	Adjusted \bar{X}
<i>Substudy 1</i>					
Instructor 1 (science)					
Ideal	16	.92	79.88	12.70	3.63
Best	14	.93	75.07	12.12	3.41
Average	19	.95	79.58	13.05	3.61
Worst	14	.94	85.79	11.44	3.89
Instructor 2 (finance)					
Ideal	24	.88	90.58	8.70	4.12
Best	18	.92	84.72	11.64	3.85
Average	20	.85	82.35	11.95	3.74
Worst	20	.96	84.90	16.34	3.86
<i>Substudy 2</i>					
Instructor 1 (finance)					
\bar{X} High School	24	.90	88.46	10.19	4.02
\bar{X} College-Univ.	22	.93	89.36	13.36	4.06
\bar{X} All	27	.93	88.15	12.16	4.01
Instructor 2 (communications)					
\bar{X} High School	18	.93	77.28	14.12	3.51
\bar{X} College-Univ.	22	.92	74.45	11.85	3.38
\bar{X} All	23	.96	76.83	15.52	3.49

point scale, for the four treatments for the two instructors for both sub-studies.

It is immediately apparent that all of the reliability estimates are high, even those of the small samples in Substudy 1. Thus the respective sample group means can legitimately be used as dependent variables of the effects of the different rating referents.

ANOVAs on total score for each instructor in each substudy indicated no significant differences for means in either substudy. Examination of these means indicates no differences other than sampling fluctuations for both instructors in Substudy 2. The differences between means are greater for both instructors in Substudy 1. There are some tendencies across both instructors in Substudy 1. Initially, high means tend to be associated with ratings against "Ideal" and "Worst" referents. Secondly, low means tend to be associated with ratings against "Best" and "Average" referents. However, speculation to account for these differences must await statistically significant replication.

ANOVAs were also run for individual items for each instructor in each substudy. There were no significant differences for any individual items for any of the four classes.

D. CONCLUSION

Different rating referents were not associated with differences in level of ratings awarded to college instructors by student raters.

REFERENCES

1. DE JUNG, J. E. Effects of rater frames of references on peer ratings. *J. Exper. Educ.*, 1964, **33**, 121-131.

College of Education
University of South Florida
Tampa, Florida 33620

THE EFFECT OF INCREASING READING RATE ON COMPREHENSION*¹

Wichita State University

HOWARD C. HIMELSTEIN² AND GARY GREENBERG

SUMMARY

Operant conditioning techniques were employed to increase reading rate of 10 experimental subjects who had been matched for reading rate and comprehension with 10 control group subjects. This procedure was designed to determine the effect on comprehension of a significant reading rate increase. While a significant difference was obtained in reading rate between the control and experimental groups, there was no such difference in the comprehension scores between the two groups. The comprehension scores remained essentially unchanged for both groups.

A. INTRODUCTION

Operant conditioning techniques have been creatively applied with varying degrees of success to a wide range of human behaviors including language acquisition (13), child rearing (3), and the acquisition of safe driving habits (10). However, only recently have studies employing behavioral methods focused on such complex human behaviors as the improvement of reading skills (1, 12). As recently as 1966, Raygor, Wark, and Warren stated that there were no published reports of reading improvement in adults employing operant conditioning methods (9). The primary reason for this dearth of studies has been the emphasis on defining and isolating the various operants involved in a behavior as complex as reading. Experimenters have in the past considered reading rate as an operant that should be analyzed into its component behaviors prior to experimental manipulation.

The experiments of Raygor *et al.* (9) and Tinker (15) indicate that the basic elements of reading rate are such behaviors as ocular motor habits, subvocal verbal chains, and specifiable emotional responses. While it is

* Received in the Editorial Office on November 8, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Submitted as partial fulfillment for the M.A. degree at Wichita State University, 1971, by the first author.

² Reprints may be obtained from Howard Himelstein, Dutchess Community College, Poughkeepsie, New York 12601.

important to be cognizant of the lower level behaviors that comprise reading, it should be realized that reading is a behavioral event in and of itself and can be so manipulated.

Another reason for the scarcity of operant reading studies has been the difficulty of dealing with the complexity of the reading rate/comprehension relationship. Investigators have concentrated on operantly increasing the number of words per minute that their subjects read, while neglecting to correlate this reading increase with corresponding comprehension changes. Comprehension was measured in the majority of studies only after the subjects had attained a significant increase in reading rate. Thus reading rate was being manipulated over small increments of time (words per minute), and comprehension changes were being measured only after the completion of the entire reading experiment or program. These two factors are primarily responsible for the omission of appropriate investigations into the nature of the reading rate/comprehension relationship.

Reading rate and comprehension have been given individual attention, but the immediate effect of increasing reading rate on comprehension has not been adequately considered. Raygor, Wark, and Warren demonstrated that reading rate of adults could be increased by a factor of 2.0 to 2.5 in one 45-minute training session with their techniques (9). The reinforcer utilized in their study was a green light that was reflected through the page being read. The subject pulled a lever to reveal new reading material and turn on the green light. If new material was exposed in shorter intervals of time, the subject would receive an increasing number of green reinforcement lights. If an increased rate of lever pulling was not maintained, the subject would not receive the green light for that page. This procedure proved successful, as both subjects increased their reading rate by an average factor of 2.2. However, standardized reading material was not employed, and comprehension of the reading material was not tested at the conclusion of the session. A second experiment did use standardized reading material, but the function of the green light was not mentioned to the subjects. Thus the subjects read the material and pulled the lever to expose new material, but they were not informed that a green light would appear if the lever was pulled in increasingly shorter time intervals. Again comprehension was given no consideration. In this experiment, reading rate also increased, but not as much as when the subjects were informed of the function of the green light. Thus knowledge of the reinforcing contingencies tends to increase reading rate further. However, these investigators could be accused of reinforcing increased frequency of lever pulling and not reading speed because the experiments cited above employed no comprehension tests.

The above indicates that reading rate can be increased with operant techniques. Another recent study (8) reported even more dramatic increases in reading speed, some exceeding 2000 words per minute! The relationship between reading speed and comprehension in this study was either entirely overlooked or considered important enough to be given only minimal attention. The reinforcement contingencies employed apparently increased the rate of reading by reinforcing decreasing time intervals between some operant (e. g., lever pulling) which was used to measure the subject's reading rate. The absence of controlled comprehension checks in these studies seems to indicate that the behavior being manipulated was the operant that was utilized to measure the rate of reading, not reading rate itself. In view of this, some studies (9, 16) merit reconsideration.

It was recently determined that the correlation between reading rate and comprehension was found to range all the way from low negative to high positive (5). Because of the amount of reading that must be done to stay abreast of current events, the issue of reading speed has taken on new importance. In addition, the need to determine the validity and usefulness of current speed reading programs is of the utmost urgency in light of the large number of people engaged in such programs.

The present study attempted to explore the relationship between increasing reading rate and corresponding comprehension changes. This relationship has received little attention, but warrants in-depth research in light of its importance to the entire reading field. Therefore, the present study posed the following question: As reading rate increases, will there be a change in the amount of material comprehended?

B. METHOD

1. *Subjects*

One hundred subjects (Ss) were chosen from an introductory psychology laboratory class on a volunteer basis. No attempt was made to control for sex or age of Ss beyond the age limitations imposed by college enrollment, but the 20 Ss that were eventually employed were matched for base reading rate and comprehension level.

2. *Apparatus*

Thirteen typed booklets of college level reading material were taken from a well-known source for standardized reading material (2). The booklets were designed so that each one contained 1000 words. In 12 of the booklets, there was an increase of 15 words per page (wpp) from booklet 1 to booklet 12. Thus each succeeding booklet had 15 more wpp than the pre-

ceding booklet. The first booklet had 235 wpp and the last booklet had 400 wpp, providing an increase of 165 wpp for the 12 booklets. There was also a 1000 word booklet from which the subject's base reading rate and comprehension level was determined.

The reinforcing apparatus had outlets for green and red lights which the experimenter could separately switch on to reinforce the Ss either positively (green) or negatively (red). The intensity of the lights allowed the Ss to see them easily, but apparently did not interrupt their reading (this was established by postexperimental questions). The experimenter also had two stopwatches.

3. Procedure

Each S's base reading rate and comprehension score were determined as follows: The 100 students were given a standard 1000 word reading from Baker (2). The reading was timed, and a standard comprehension test from Baker was administered. The base reading booklet was typed on the same grade of paper and reproduced in the same manner as the 12 experimental reading booklets. Thus the base reading rate and comprehension level were determined from circumstances very much like those that existed during the period when reading rate was increased.

From these 100 subjects, two groups (a control and an experimental group) of 10 Ss each were randomly formed. The groups were matched with respect to reading rate and comprehension level (mean reading rate for both groups was 283 words per minute; mean comprehension score for the groups were 85% and 83% for the control and experimental groups, respectively). Each S was treated similarly prior to exposure to his experimental condition. The experiment was carried out in a room with a table, two chairs, and the apparatus described above. If the S was in the experimental group, the reinforcement lights were on the table when he entered the room. If he was in the control group, the table was clear.

The following instructions were read to the Ss:

All Ss: We have determined your reading speed to be—words per minute from the reading test that has been given to you. Your object will now be to increase your reading speed. You will be given several booklets of reading material, one at a time. Try to read through each booklet as fast as possible with the greatest possible comprehension. You will be tested for comprehension after each booklet.

Control Ss only: So remember you should try to read each page as fast as possible, but you must read with the greatest possible comprehension. Have you any questions?

Experimental Ss only: For each page you complete in 45 seconds or less the green light in front of you will light to indicate you are doing well. For each page you do not complete in 45 seconds the red light in front of you will light to indicate that you are not doing well. So remember, it is to your advantage to read fast enough so that only the green light will come on, but your reading must be with the greatest possible comprehension. Have you any questions?

The experimenter (*E*) recorded the time taken to complete each booklet for the control group. No feedback was given to the control *Ss*. Comprehension tests were given after the reading of each booklet. A one-minute interval was permitted between the comprehension test and the next reading.

The *E* noted the time needed for each *S* of the experimental group to complete each page of the booklets. When reading rate equaled or surpassed the designated level (45 seconds per page), *E* switched on the green light in front of the *S* for two seconds. When reading speed did not equal the designated level, *E* switched on the red light affixed in front of the *S* for two seconds. There was a comprehension test after the reading of each booklet. There was also a one-minute interval between the comprehension test and the next reading. The *E* also measured the total time required by the experimental *Ss* to complete each of the booklets.

C. RESULTS

The 20 *Ss* were matched on the basis of their base reading rates and comprehension scores. These matched scores and the mean base reading rates and comprehension scores for the control and experimental groups are indicated in Table 1. Fisher *t* tests revealed no statistically significant differences between the control and experimental groups on either the base reading rate or comprehension variable.

TABLE 1
MEAN READING RATES (WORDS PER MINUTE) AND COMPREHENSION SCORES (PERCENT)

Experimental stage	Control group		Experimental Group	
	Reading rate	Comprehension	Reading rate	Comprehension
Basal				
\bar{X}	283	85	283	83
<i>SD</i>	19.69	11.18	19.42	7.81
Testing (all 12 booklets)				
\bar{X}	257	72	360	71
<i>SD</i>	11.71	6.83	33.78	5.17
Final (booklet 12 only)				
\bar{X}	260	81	421	76

Two preliminary t tests indicated that there was a highly significant difference ($t = 9.56$; $df = 22$; $p < .001$) between reading rates for the control and experimental groups, but no such difference between the comprehension scores. These scores are shown in Table 1.

A two-way analysis of variance with repeated measures was computed over the mean reading rates for the base reading booklet and the 12 test booklets for the control and experimental groups. The analysis indicated that there were significant effects on reading rate due solely to the difference between experimental conditions ($F = 9.16$; $df = 1$; $p < .01$). There were also highly significant results ($F = 3.88$; $df = 12$; $p < .001$) attributed to the differences between the control and experimental groups as the subjects progressed through the booklets (base reading booklet to booklet 12). In addition, a significant interaction effect ($F = 3.96$; $df = 12$; $p < .001$) was found to exist between the experimental conditions and the individual booklets.

A t test was computed for the mean comprehension scores on the 12 booklets for the control and experimental groups. The results indicated that there was no statistical difference between the groups. This analysis also indicated that there was no systematic difference between comprehension scores of the control and experimental groups. But it is interesting to note that a comparison between their own base comprehension scores and the mean comprehension scores for the 12 test booklets did show a significant decrease for the control group ($t = 2.70$; $df = 18$; $p < .02$), and the experimental group ($t = 3.59$; $df = 18$; $p < .01$).

The final mean reading rates and comprehension scores for the 20 Ss are also shown in Table 1. A t test comparing these 20 Ss revealed a significant difference with regard to the reading rate ($t = 4.76$; $df = 18$; $p < .001$) and no significant difference in comprehension.

D. DISCUSSION

It can be concluded that increasing an individual's reading rate is a relatively easy task when adequate reinforcement contingencies are employed. As McDonald (7) pointed out, one of the easiest reading changes to produce is rate variation. It is therefore not surprising that the majority of studies, including the present one, report significant increases in reading rate. It also is not surprising that the majority of subjects participating successfully in a reading program or experiment will read at their former rate shortly after they have completed the program (4). Thus it can be con-

cluded that reading rate can be easily increased by any number of techniques, but these are only short-term improvements because the subject's set of reading skills has not been permanently changed.

As indicated above, many researchers have had little difficulty in increasing reading rate, but the effects on comprehension have ranged from one end of the continuum to the other. In fact, Carver (4) reported that rate increases from 75-450 words per minute resulted in substantial *decreases* in comprehension. It is obvious that previous studies in the reading area are by no means unanimous in their conclusions concerning the effects of increasing reading rate on comprehension. The reason for the ambiguity and confusion concerning the reading rate/comprehension relationship can be found in the solution to a problem that has plagued investigators for some time: namely, the misconception that reading rate and comprehension are one and the same variable or at least very highly correlated. Tinker (14) reported that the correlation between reading rate and comprehension at the secondary and college level tends to be positive but low, around .30. Researchers have only recently realized this. McDonald (7) suggested that the reading improvement field has advanced from the days of "read faster, comprehend more" because of the efforts of many researchers, teachers, and others workers in the field. As Lafitte (6) and Carver (4) indicated, increasing one's reading rate involves a heterogeneous set of reading skills including rapid reading and skimming. This set of skills overlaps to a limited extent with a heterogeneous set of comprehension skills that are needed to increase comprehension scores. The assumption that comprehension can be manipulated as easily as reading rate is an erroneous one, based on unsupported evidence.

A question that should be raised concerns the adequacy of the present method of assessing comprehension. The measure of comprehension employed in the present study holds up well against the above-mentioned criticisms. The comprehension tests had been standardized over a large population, and although they were untimed, a consistency with other experiments of this type was maintained. If further research provides evidence that timed comprehension tests are actually better indicators of the material comprehended, then this must be incorporated into future experimental designs. The major contribution of the present study was not to deal with general criticisms of comprehension methods, but to monitor comprehension changes *as* reading rate was being increased. Prior studies have tested comprehension only *after* reading rate has been increased. Thus, while the present method did attempt

to remedy several of the problems involved in measuring comprehension, it was primarily an endeavor to develop a more desirable comprehension assessment technique.

It has been demonstrated that reading rate can be easily manipulated by various reinforcement and motivational techniques. Do these techniques affect comprehension? The answer as presented in this study, as well as others that have adequately measured comprehension, is no. To alter comprehension by experimental procedures requires an entirely different set of contingencies from those that affect reading. Shores and Husbands (11) reported that comprehension is dependent less on speed than upon intelligence, purposes of the reading, difficulty of the material read, opportunities for verifying questions of comprehension, and the continuity of the text. This set of comprehension components does not coincide with those that comprise reading rate. With this perspective, it is not surprising that reading rate was significantly increased in the present study and comprehension remained unaltered. Those investigators reporting a comprehension change when reading rate is increased have not taken into account the complexity of the comprehension process and have in all likelihood committed one or more of the errors in the measurement of comprehension that have been discussed above.

It would seem appropriate to conclude with a poignant comment made by a prominent speed-reader, Woody Allen: "I took a speed reading course, learning to read straight down the middle of the page, and I was able to go through *War and Peace* in 20 minutes. It's about Russia" [cited in Carver (4), p. 22].

REFERENCES

1. BAER, D. M. Effect of withdrawal of positive reinforcement on an extinguishing response in young children. *Child Devel.*, 1961 **32**, 67-74.
2. BAKER, W. K. *Reading Skills*. Englewood Cliffs, N. J.: Prentice-Hall, 1953.
3. BIJOU, S. W., & BAER, D. M. Operant methods in child behavior and development. In W. K. Honig (Ed.), *Operant Behavior: Areas of Research and Application*. New York: Appleton-Century-Crofts, 1966.
4. CARVER, R. P. Speed readers don't read; They skim. *Psychol. Today*, 1972, **6**(3), 22-30.
5. HARRIS, A. J. Research on some aspects of comprehension, rate, flexibility, and study skills. *J. Reading*, 1968, **12**, 205-258.
6. LAFITTE, R. G. An analysis of increased rate of reading of college students. *J. Devel. Reading*, 1964, **7**, 165-174.
7. McDONALD, A. S. Research for the classroom. *J. Reading*, 1965, **7**, 187-191.
8. McLAUGHLIN, H. Reading at "impossible speeds." *J. Reading*, 1969, **12**, 449-502.
9. RAYGOR, A., WARK, D., & WARREN, A. Operant conditioning of reading rate. *J. Reading*, 1966, **9**, 147-156.

10. SCHUSTER, D. H. Attitudes toward driving safety and their modification. *Hum. Factors*, 1970, **12**, 89-94.
11. SHORES, J. H., & HUSBANDS, K. L. Are fast readers the best readers? *Element. English*, 1950, **27**, 34-38.
12. STAATS, A. W., STAATS, C. K., SCHUTZ, R. E., & WOLF, M. The conditioning of textual responses using "extrinsic" reinforcers. *J. Exper. Anal. Behav.*, 1962, **5**, 33-40.
13. SULLIVAN, M. W. Programmed learning in foreign languages. In A. D. Calvin (Ed.), *Programmed Instruction: Bold New Venture*. Bloomington: Indiana Univ. Press, 1969.
14. TINKER, M. A. Speed versus comprehension in reading as affected by level of difficulty. *J. Educ. Psychol.*, 1939, **30**, 81-94.
15. ———. Recent studies of eye movements in reading. *Psychol. Bull.* 1958, **55**, 215-231.
16. WARK, D. M. Application of operant conditioning in a college reading center. *J. Reading*, 1966, **9**, 27-37.

Department of Psychology
Wichita State University
Wichita, Kansas 67208

A COMPARISON OF REASONING SKILLS AND MORAL JUDGMENTS IN DELINQUENT, RETARDED, AND NORMAL ADOLESCENT GIRLS*¹

*Reading Counseling Center, Cheltenham, Pennsylvania;
and Temple University*

CHARLES K. MILLER, LARRY ZUMOFF, AND BETH STEPHENS²

SUMMARY

A study was made of the reasoning and moral judgment development of female delinquents. The subjects consisted of 30 adolescents incarcerated in an institution. The level of development of 16 of these delinquents was compared with that of 16 retarded and 16 normal subjects.

Results indicated that the delinquents showed arrestations in their cognitive development but demonstrated no gaps in their ability to formulate moral judgments. Findings suggest that Piagetian assessment would be useful in planning habilitation programs for delinquents.

A. INTRODUCTION

Estimates from court statistics indicate that about 1% of school age children become legally delinquent each year, and that 10% become delinquent before reaching maturity. Juvenile offenses increase steadily until the sixteenth year when the rate begins to decline gradually (14). These figures are actually minimal estimates because a large number of offenders are never referred to the courts and thus do not become "delinquent" in the legal sense. Delinquency represents a problem of prime social importance and suggests the need for understanding and preventing the development of delinquent offenses.

The range of intelligence among delinquents is very wide, but the average is lower than that of the general population. Shuey (13) found that the average *IQ* of delinquents ranged from 74 to 80. Moreover, delinquents

* Received in the Editorial Office on November 12, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The study was conducted with the assistance of a research grant (3638-BR) provided by the Wordsworth Academy Research and Scholarship Foundation, Fort Washington, Pennsylvania.

² The third author is at Temple University.

tend to do less well on predominantly verbal intelligence tests and better on nonverbal measures.

Among young people convicted in the courts, there are about five times as many boys as girls, and those offenses committed by girls are characteristically different. Girls are much more often guilty of sexual misdemeanors or incorrigibility (1). Research efforts devoted to the origins and characteristics of female delinquents have been sparse compared to those of male offenders.

The purpose of the present study was to compare the reasoning skills and moral judgments of delinquent adolescent girls with those of retarded and normal girls. The extensive research conducted by Piaget which addresses itself to both measures of reasoning skills and moral judgmental tests serves as the theoretical framework of the study.

When Piaget (8) viewed morality as a formative process, three phases were found to exist. In the first phase, moral constraint from adults leads to heteronomy and moral realism. During the second phase, rules and commands are interiorized, while in the third, there is achievement of cooperation which leads to autonomy.

The process that Piaget holds responsible for the development of morality is the same process that engenders rationality in general, and because of this, a theoretical tie exists between reasoning and moral judgment. To determine the limit of moral judgment achieved by a subject, Piaget typically confronts the child with a story that demands a decision involving moral judgment. The subject's reply denotes his level of functioning in this area. Tests of Piaget's theory of moral judgment by MacRae (5) substantiated the stages posited by Piaget. Kohlberg (4) extended consideration to the adolescent period of the development of moral thinking and choice in persons ages 10 to 16.

A longitudinal study (12) which compared mentally retarded and normal subjects, ages six to 18, on Piagetian reasoning tasks and notions of morality found that the normals' performance exceeded that of retardates on each reasoning task. In addition, moral judgment was found to be developmental in nature with successful performance increasing with age.

B. METHOD

1. Subjects

The sample was composed of 30 delinquent girls, ages 13 to 16. The subjects were randomly selected from a facility for delinquent girls in the Greater Philadelphia area. Each of the subjects had been placed into the

institution by the courts and had been adjudged delinquent. Criminal offenses of the population included promiscuity, incorrigibility, truancy, running away, thievery, and overt aggressive acts. Each of the subjects had been incarcerated at least three months, the average stay being 18 months. On the basis of Warner's Index of Social Status (6) the sample was judged to be composed wholly of lower class youngsters.

In an effort to determine the relationships that existed between reasoning and moral judgment and to compare development in these areas between the sample of delinquents and a randomly selected group of retardates and normals, each subject's performance was measured on six reasoning and four moral judgment tasks. From this sample of 30 delinquents, 16 were randomly drawn for comparison with 16 female retardates (*IQ* 50-75) and 16 female normals (*IQ* 90-110), matched on age and randomly selected from public school classrooms. In addition, standardized measures were obtained from the Wechsler Scales, the Wide Range Achievement Test (WRAT), and the Gates Reading Survey.

2. Reasoning Experiments

Following Inhelder's approach (3) to the diagnosis of reasoning, experiments were chosen to include measures of conservation, elementary logic-classification, symbolic imagery, and formal operations.

a. Conservation of substance (9). After the child agreed that two six inch balls had the same amount of clay, one ball was successively transformed into a "hot dog," a "pancake," and into a dozen small pieces. In each case the child compared the amount of clay in the transformed ball with that in the unchanged ball.

b. Conservation of weight (9). Two clay balls of equal weight were placed on a scale. After the youngster agreed to their equality, the transformations discussed above were made. In this instance, however, the child judged the weight rather than the size of the transformed ball.

c. Conservation of volume (9). After the youngster agreed to the equality of two clay balls and the equality of two beakers of water, one clay ball was successively transformed into a "hot dog," "pancake," and small pieces, and the child was asked whether the water levels in the beakers would remain the same if the transformed ball was placed into one and the nontransformed ball into the other. In the second part of the experiment a metal ball replaced one of the clay balls.

d. Class inclusion—animals (11). Task requirements were to sort a set of 17 pictures into three related piles (ducks, birds, and animals). After the

initial classification, the subject was questioned on class inclusion and possible class extensions.

e. Changing criterion (10). Twenty cardboard geometric figures were to be stored into two stacks; 10 figures were round, 10 square; 10 figures were red, 10 blue; 10 figures were large, 10 small. After the subject explained his classification, he was encouraged to sort on another criterion. The procedure was repeated for a total of three sorts. Finally the subject was asked to recall his initial classification.

f. Rotation of beads (7). Three different colored beads mounted on a stiff wire were exhibited. After the beads were placed into a tube, the tube was rotated. The task was to judge which of the three beads would emerge first from the tube.

3. Moral Judgment Experiments

The three areas of moral judgment measured were (*a*) ability to consider intent of teller rather than extent of deviation from truth in determining culpability of falsehoods; (*b*) maturity in evaluation of objective *versus* subjective responsibility; and (*c*) regard for punishment by reciprocity which is derived from ideas of equality, rather than expiatory punishment which is based on retributive justice.

Below are brief descriptions of the moral judgment experiments:

a. Lying. After he provided a definition of the term "lie," the subject was read a series of paired stories, each accompanied by a pertinent drawing. Then he decided which of the two trespasses related in the story was the more serious.

b. Justice—retributive or reciprocal. A story of a misdeed followed by three possible modes of punishment was read to the subject. Each mode of punishment was verbally explained and pictorially represented. The subject then was asked to choose the fairest punishment, the hardest punishment, the one he himself would choose, and the one his parents might use. The procedure was repeated until opinions were elicited for several stories.

c. Punishment—expiatory and reciprocal. After a story involving two types of punishment was read to the subject, he was required to judge which type would discourage further misdeeds.

d. Collective responsibility. Stories were read to the subject which required him to make judgments concerning the justice of punishing an entire group for something one member had done. In some instances identity of the wrongdoer was unknown.

4. Procedure

Three experimenters, trained in Piagetian assessments, conducted the testing. Three testing sessions were required. The order of the tests was the same for each subject. In an effort to prevent the establishment of a response set, two similar experiments (for example, conservation of substance and conservation of weight) were not administered successively.

5. Scoring

Two types of scores were assigned to the assessments: dichotomous (pass-fail) and point-scale scores. All reasoning tasks were first awarded a dichotomous pass-fail score. Then the explanation advanced by the subject for his response was scored on a five to nine point scale comprised of the following intervals: (a) *Fail*; (b) *Oscillation-incorrect*, initial correct response is altered to an incorrect one; (c) *Oscillation-correct*, an initial incorrect response is replaced with a correct one; (d) *Pure intuitive*, the right answer is given, but reason for the statement is lacking; (e) *Concrete intuitive*, the correct concrete answer reflects perceptual influence; (f) *Concrete without reversibility*, the correct response addresses consideration to pertinent elements, but there is no indication of reversibility of thought processes; (g) *Concrete with reversibility*, response indicates an ability to reverse thought processes; (h) *Concrete merging into formal*, answers suggest transition from concrete to abstract thought processes; (i) *Formal*, ability to solve problems without recourse to concrete materials is indicated.

A three point system devised by Kohlberg (4) was used to score three measures of moral judgment: lying, justice, and clumsiness and stealing. The scale was comprised of the following intervals: (a) *Fail*, no response or a bizarre or irrelevant one; (b) *Response that focuses on consequence of an act*; (c) *Response that focuses on intentions rather than consequences*.

The following four point scale was devised to measure judgment in terms of collective responsibility: (a) *Punish everyone*. (b) *Punish no one with no reason*. (c) *Punish only the guilty ones, but with no clear reason*. (d) *Punish only the guilty ones with a clear reason*.

C. RESULTS

The delinquent girls had a full scale *IQ* of 88.38 and a standard deviation of 10.98. The results of intellectual testing places them midway between the retarded (full scale *IQ* = 71.81, *SD* = 7.13) and normal (Full scale *IQ* = 102.19, *SD* = 9.03) comparative groups.

A correlation matrix was computed to relate all intellectual, achievement, reasoning, and moral judgment variables for the total delinquent group ($N = 30$). Conservation of substance was the only conservation measure that showed a significant relationship to intellectual measures. Measures of weight and volume were only moderately related to intelligence test scores. Classificatory skills were significantly related to verbal functioning.

With only a few exceptions, measures of conservation, classification, and moral judgment appear relatively independent of one another. Reasoning skills thus measured factors not explained by either data derived from the Wechsler or concepts of moral judgment. As expected, measures of achievement were significantly related. Only concepts involving falsehoods were related to chronological age. The lack of significant relations as a function of age was likely due to the restricted age range.

Sixty percent of the delinquent group had not firmly established conservation of substance. Only 33% of the group displayed conservation of weight, while 6% revealed conservation of volume. In no case did a subject who failed to achieve conservation of substance display conservation of weight or volume.

An analysis of variance compared the delinquent and retarded subjects' performance on each measure. Although the delinquent population differed significantly from the retardates on measures of intellectual ability, the retardates scored significantly higher on spelling and arithmetic achievement as measured by the WRAT. There were no significant differences between the two groups on any measure involving either conservation or classification skills.

On only one measure of the rotation of beads experiment were the delinquents superior to the retardates. The latter task involved anticipating order after the beads had been rotated 360 degrees.

Of the several moral judgment measures, the delinquents scored significantly higher on two subtests involving concepts of clumsiness and stealing. Both measures involved concepts of intentions *versus* consequences. The retardates tended to respond to the consequences of a specific action and disregard the intentional aspects.

An analysis of variance that compared the delinquent and normal girls indicated that the normal girls significantly surpassed the delinquents on all measures of intellectual and achievement measures. On all measures of conservation skills, the normals significantly outperformed the delinquent group. Out of 10 classification tasks, the normals scored significantly higher on eight of them.

When moral judgment tasks were compared between the delinquent and normal groups, on no task did differences between the groups reach a level of significance. All significant differences between the two groups are to be found in intellectual-cognitive functioning rather than notions of social behavior.

To determine whether any differences found between the delinquents and normals were due to the influence of intellectual factors, an analysis of covariance was utilized with verbal performance and full scale IQ covaried. The results indicated that differences between the groups remained significant and were not attributable to the lowered IQ of the delinquent subjects.

D. DISCUSSION

Intellectually, the female delinquents functioned at a borderline level. Despite this, their educational skills were not commensurate with their intelligence but fell significantly below grade expectations. It was unexpected that their academic skills would be surpassed by a mentally retarded sample. The findings suggest that learning disabilities are highly related to juvenile delinquency and are not explainable on the basis of intellectual deficits.

Despite the finding that conservation of substance is usually attained by seven to eight years old (2), 40% of the delinquent group had not firmly established the concept. Similar results were applicable to conservation of weight. With only two exceptions, the delinquent group had not attained the stage of formal operations.

The reasoning skills of the female offenders were characterized by their responding to the perceptual characteristics of the stimuli. In addition, many subjects displayed concepts that were oscillatory in nature. They would maintain the equality of the test objects in one response, but claimed inequality of an ensuing item. This would suggest that they were still developing operations at a concrete stage of thinking but were frequently regressing to preoperational structures.

The low correlations between the Wechsler scores and reasoning tasks suggest that the Piagetian measures are assessing intellectual areas independent of IQ measures. Similar findings have been reported by Stephens, Miller, and McLaughlin (12).

When the delinquents' performance was compared with that of the retarded group on Piagetian reasoning measures, anticipated cognitive differences were not to be found. No significant differences existed between the delinquents and retardates on Piagetian measures of reasoning, although the two groups differed significantly on IQ. Cognitively, then, the delinquents' reasoning was

similar to that of the retardates, but the delinquents showed a slightly higher level of sophistication in relation to moral judgment situations.

The normal group, although surpassing the delinquents in both cognitive and classificatory skills, functioned at the same moral judgment level. Thus for this group of delinquents, there was no question that they knew the appropriateness of selected social behaviors and could easily respond to the intentions of a particular action. *Obviously, however, their degree of moral judgment was not related to their own moral conduct.*

The results of the study suggest that the subjects' delinquent acts of behavior may be related to arrestations in reasoning skills rather than to faulty concepts of social behavior. Thus, habilitation programs might be designed to remediate specific cognitive areas of deficit. To what extent gaps in cognitive skills have interfered with academic achievement in delinquent groups would be a fruitful area for further research.

REFERENCES

1. COWIE, J., COWIE, V., & SLATER, E. Delinquency in Girls. New York: Heinemann, 1968.
2. INHELDER, B. Cognitive development and its contribution to the diagnosis of some phenomena of mental deficiency. *Merrill-Palmer Quart.*, 1966, 12, 229-320.
3. ———. The Diagnosis of Reasoning in the Mentally Retarded. New York: Day, 1968.
4. KOHLBERG, L. The development of modes of moral thinking and choice in the years 10-16. Unpublished Doctoral dissertation, University of Chicago, Illinois, 1958.
5. MACRAE, D. A test of Piaget's theories of moral development. *J. Abn. & Soc. Psychol.*, 1954, 49, 14-18.
6. MCGUIRE, C., & WHITE, G. D. The measurement of social status. Research paper in Human Development, No. 3, Laboratory of Human Behavior, The University of Texas, Austin, 1955.
7. PIAGET, J. The Child's Conception of Number. New York: Humanities, 1952.
8. ———. The Moral Judgment of the Child. New York: Collier Books, 1962.
9. PIAGET, J., & INHELDER, B. Le Developpement des Quantites Physiques chez l'Enfant. Neuchatel, Switzerland: Delachaux et Niestle, 1941.
10. ———. La Genese des Structures Logiques Elementaires: Classification et Seriation. Neuchatel, Switzerland: Delachaux et Niestle, 1959.
11. ———. Cognitive assessments. Personal communication, 1964.
12. STEPHENS, W. B., MILLER, C. K., & MCLAUGHLIN, J. The development of reasoning, moral judgment, and moral conduct in retardates and normals. Research grant RD-2382-P, Department of Health, Education, & Welfare, Washington, D. C., May, 1969.
13. SHUEY, A. M. The Testing of Negro Intelligence. New York: Soc. Sci. Press, 1966.
14. UNITED STATES JUSTICE DEPARTMENT, FEDERAL BUREAU OF INVESTIGATION. Uniform Crime Reports, 1960. Washington, D. C.: Department of Justice, 1960.

Reading Counseling Center

516 Cottman Avenue

Cheltenham, Pennsylvania 19012

ELIMINATION OF SUBTRACTION ERRORS BY CONTINGENT SELF-CORRECTION IN RETARDED CHILDREN*¹

Bureau of Child Research, University of Kansas

PAUL M. SMEETS² AND SEBASTIAN STRIEFEL

SUMMARY

Three institutionalized educable mentally retarded children who added subtraction problems served as subjects. Four experimental conditions were used in conjunction with a combination of a multiple baseline and reversal design. Identification of the type of error and reduction of subtraction errors were observed as a result of a contingent self-correction procedure.

A. INTRODUCTION

Recent investigations using behavior analysis procedures have demonstrated that the arithmetic performance of retarded and other learning handicapped children may be enhanced by the systematic manipulation of antecedent (5) and consequent events (2, 3, 4, 5, 6, 7, 8, 11). An antecedent event refers to those stimuli that occur *before* the emission of a specified behavior. An example of an antecedent event would be the teacher's instruction. A consequent event refers to those stimuli that immediately *follow* the emission of the response: e. g., teacher's praise for a correct answer. The effect of these environmental controls traditionally has been expressed in terms of the proportion of correct answers or of the rate of correct answers per minute. The implied correct-incorrect classification, however, is only partly adequate when the child makes different types of errors and/or when one type of error accounts for a major proportion of the total number of incorrect responses. In such instances, an additional error analysis is deemed necessary. For example, a child has made two different types of errors if he responds to the

* Received in the Editorial Office on November 19, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This investigation was partially supported by PHS Training Grant HD 00183 from the National Institute of Child Health and Human Development to the Kansas Center for Research in Mental Retardation and Human Development, and NICHD Grant HD-00870. Appreciation is expressed to Juanita Haywood for her support and cooperation during the initial phase of the study.

² Now at the California School for the Deaf.

printed stimulus $3 - 2 = \text{---}$ with either 0 or 5. If the response to the above problem is zero, it may be assumed that the child observed the minus sign, though he subtracted inaccurately. In contrast, if the response to the same problem is 5, the child ignored the minus sign and added accurately.

The present study was prompted by several children in a classroom for educable retarded children who usually added subtraction problems if they were randomly interspersed with addition problems. Discussions with teachers revealed that the children demonstrated subtraction skills occasionally, so that the addition of subtraction problems could not be attributed to a lack of subtraction skills. The purpose of this study was to evaluate empirically the effect of contingent self-correction on the elimination of subtraction errors, particularly the error of adding when subtraction is called for. The selected consequence procedure was one that is commonly used by teachers; i. e., instructing the child to redo his incorrect answers. However, the procedure is one that has not been evaluated systematically. Thus, the systematic use of this procedure might provide data relevant to its effectiveness. Another consideration for selecting this technique was that it might prove to be a fast and simple technique which could be used effectively by teachers who have not had extensive exposure to contingency management procedures.

B. METHOD

1. *Subjects and Setting*

Three institutionalized, educable mentally retarded children (two boys and one girl) served as subjects. All subjects were 14 years of age and had been enrolled in special education classes for some years. Available test results indicated that the subjects' grade placement levels for arithmetic varied between .9 and 2.4.

The study was conducted in a small carpeted room furnished with a table and two chairs. Illumination consisted of both a ceiling and a table lamp. The experimenter was seated at the same table as the subject.

2. *Materials*

The stimulus material was presented in the form of a worksheet. Each worksheet consisted of a regular $8\frac{1}{2} \times 11$ " page with 10 addition and 10 subtraction problems presented in four rows of five problems. The problems were randomly selected from a pool of 20 addition and 20 subtraction problems with the exception that the same problems were selected every other session. Each problem consisted of two one-digit numbers, one above the other, a plus or minus sign located left of the lowest number, and a

horizontal line located underneath the bottom number. The correct response for each of the addition problems never exceeded 9. The correct response for each of the subtraction problems was always equal to or greater than zero. The addend and the subtrahend were always greater than zero. Addition and subtraction problems were presented in random order with the exception that neither type of problem was presented more often than three times in succession. In order to prevent differences in the print quality of the problems for different subjects, all problems were Xeroxed from the same master sheet.

3. Procedure

Subjects were seen once a day five days a week. The duration of sessions varied from seven to 15 minutes. The experimental design consisted of a multiple baseline (1) with an attempted return to baseline (reversal). The study included the following four conditions:

a. *First baseline condition.* During this period, the experimenter would hand the subject a pencil, a writing pad, and a worksheet and say, "I want you to do these problems." The experimenter engaged in some paper work while the subject was assumed to work on his assignment. Except for requests, such as for another pencil, attempts by the subject to engage in discussions were ignored by the experimenter. As soon as the subject indicated that he had finished his assignment, the experimenter and subject would leave the room without reviewing the answers. This condition lasted four, seven, and 10 sessions for subjects 1, 2, and 3, respectively.

b. *Treatment condition.* During this condition the experimenter's behavior was identical to that during the baseline condition except that, before leaving the room, the experimenter would review the subject's written answers. He would then indicate the incorrect ones with a red check mark while giving the instruction, "I want you to do these over again." When the subject had changed his errors, the experimenter would review them again and, if necessary, request the subject to do the incorrect problems over again. Thus the subject would never leave the room unless all answers had been corrected. This condition was terminated at session 15 for all subjects.

c. *Second baseline condition.* This condition was identical to the first baseline condition and lasted from session 16 to session 20 for all three subjects.

d. *Postcheck condition.* The experimenter's behavior during the two sessions of this condition (sessions 21 and 22) was identical to that of the baseline conditions. The postcheck condition differed from the other conditions in that the interval between sessions was two weeks for subjects 1 and 3, and three weeks for subject 2.

During all conditions, subjects received a candy bar of their choice after leaving the room but before leaving the building.

4. Measurement

The following response classification system was used for all subjects:

a. *Addition errors.* This category included any type of incorrect response to an addition problem.

b. *Subtraction errors.* This class included any type of incorrect response to a subtraction problem.

b. (a) *Subtractions added.* This category is a subclass of the category "Subtraction errors." It included only those responses in which the subject had correctly added the minuend and subtrahend of a subtraction problem.

C. RESULTS

Seven worksheets completed by each subject were rescored by another person independently. For each subject, two worksheets were randomly selected from each of the first three conditions, and one worksheet from the final condition. An item-by-item scoring comparison revealed that the experimenter and other scorer never disagreed on the classification of any of the 504 reviewed responses.

The data are presented in Figure 1. The data from the treatment condition show the subjects' initial responses: i. e., before they were told to redo the problems on which they had made errors.

During the first baseline condition, all three subjects responded incorrectly on virtually all subtraction problems. For Subjects 1 and 2, the errors on subtraction problems consisted mainly of addition responses. Both subjects made very few or no addition errors. Subject 3 differed from both other subjects in that she made more addition errors and added fewer subtraction problems during the initial sessions of this condition. No marked difference in performance was observed between subjects during the final sessions of the first baseline condition.

All three subjects showed a dramatic decrease in the number of subtraction problems correctly added during the first two sessions of the treatment condition and eventually ceased adding the subtraction problems during the final sessions of this condition. It should be noted that by design, the treatment procedure for each of the subjects was introduced at a different point in time. Subjects 2 and 3 continued to add subtraction problems when Subject 1, already exposed to the treatment procedure, discontinued to make this type of error. However, as soon as the treatment procedure was introduced to Subject 2, he discontinued adding the subtraction errors, while Subject 3 con-

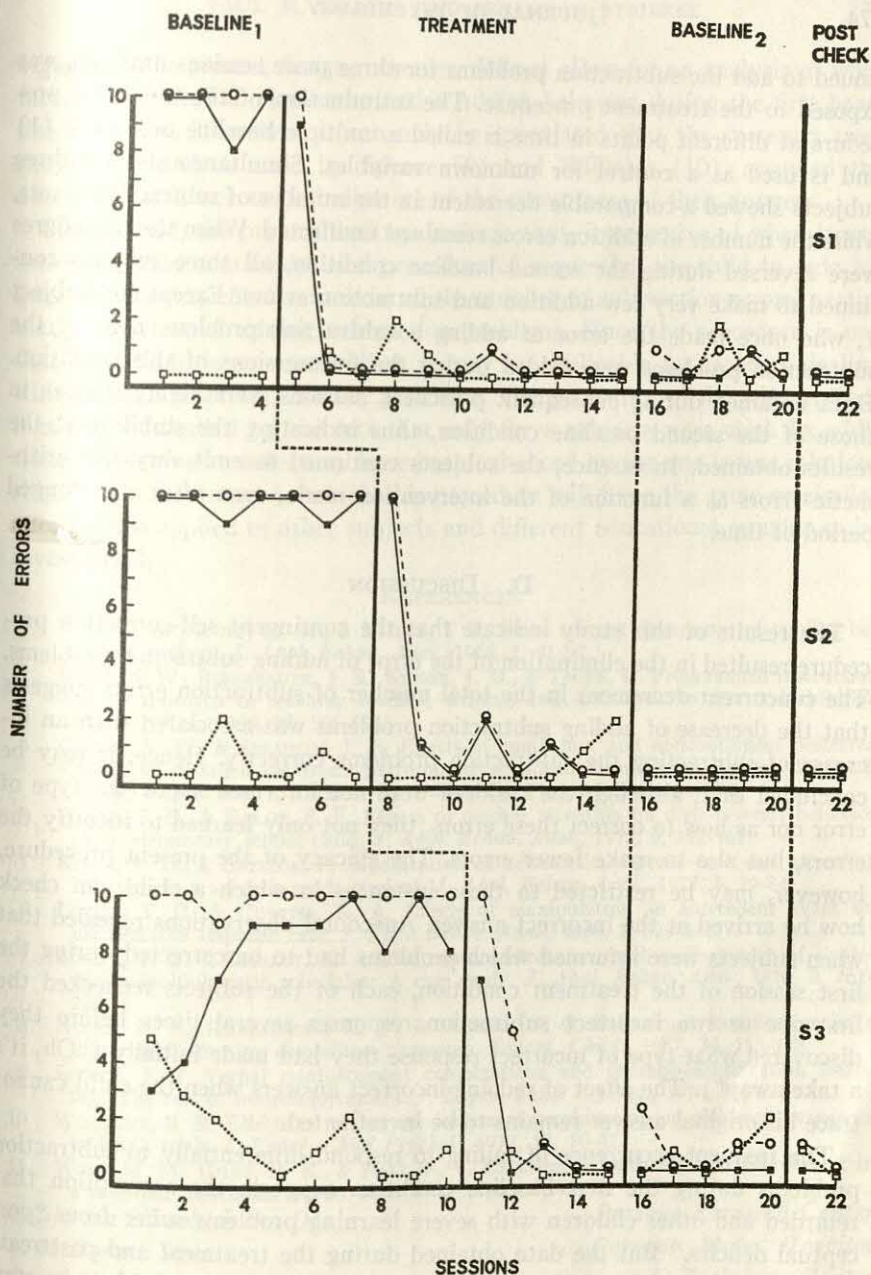


FIGURE 1

NUMBER OF ERRORS ACROSS CONDITIONS FOR SUBJECTS 1, 2, AND 3

The open squares refer to addition errors; the open circles refer to subtraction errors; and the closed squares refer to subtractions added.

tinued to add the subtraction problems for three more sessions until she was exposed to the treatment procedure. The introduction of the treatment procedure at different points in time is called a multiple baseline procedure (1) and is used as a control for unknown variables. Simultaneously, all three subjects showed a comparable decrement in the number of subtraction errors, while the number of addition errors remained unaffected. When the procedures were reversed during the second baseline condition, all three subjects continued to make very few addition and subtraction errors. Except for Subject 1, who once made the error of adding a subtraction problem, none of the subtraction problems were added during the five sessions of this condition. Data obtained during subsequent postcheck sessions were highly similar to those of the second baseline condition, thus indicating the stability of the results obtained. In essence, the subjects continued to emit very few arithmetic errors as a function of the intervention made, even after a prolonged period of time.

D. DISCUSSION

The results of this study indicate that the contingent self-correction procedure resulted in the elimination of the error of adding subtraction problems. The concurrent decrement in the total number of subtraction errors suggests that the decrease of adding subtraction problems was associated with an increase of subtracting the subtraction problems correctly. Hence, it may be concluded that, although the children were not informed about the type of error nor as how to correct these errors, they not only learned to identify the errors, but also to make fewer errors. The efficacy of the present procedure, however, may be restricted to those instances in which a child can check how he arrived at the incorrect answer. Anecdotal observations revealed that when subjects were informed which problems had to be corrected during the first session of the treatment condition, each of the subjects rechecked the first one or two incorrect subtraction responses several times before they discovered what type of incorrect response they had made initially ("Oh, it's a take-away"). The effect of redoing incorrect answers when the child cannot trace his original answer remains to be investigated.

The frequent occurrence of failing to respond differentially to subtraction problems during the first baseline condition supports the assumption that retarded and other children with severe learning problems suffer from "perceptual deficits." But the data obtained during the treatment and posttreatment conditions suggest that such perceptual deficits may be largely controlled by the environment instead of being a permanent feature of a defective

organism. The present design, however, did not allow for an analysis of what factors controlled the indiscriminative adding behavior during the first baseline condition. Therefore, it can only be speculated that the presently used subjects, like those used by Spence (9) and Williams (10), assumed the absence of feedback to be indicative of the correctness of their answers.

Summarized, the present findings indicate that, irrespective of when it was introduced, the commonly used procedure of requesting the child to redo his incorrect answers effectively reduced the number of subtraction errors, particularly the error of adding subtraction problems. Since the procedure is one that requires little time and effort, it may be applicable for teachers dealing with children beset with similar problems. The generality of the present findings may be limited by the fact that only three subjects were used. In addition, the obtained results may have been enhanced by the one-to-one relationship. Thus, the extent to which this procedure will have the same or similar effects when applied to other subjects and different educational remains to be investigated.

REFERENCES

1. BAER, D. M., WOLF, M. M., & RISLEY, T. R. Some current dimensions of applied behavior analysis. *J. Appl. Behav. Anal.*, 1968, **1**, 91-97.
2. BIJOU, S. W., BIRNBAUER, J. S., KIDDER, J. D., & TAGUE, C. Programmed instruction as an approach to teaching reading, writing, and arithmetic to retarded children. *Psychol. Rec.*, 1966, **16**, 505-522.
3. COTTER, V. W., & SPRADLIN, J. R. Effects of contingent and noncontingent preferred music on retarded children's performance of addition problems. Parsons Research Center Report No. 2, Parsons State Hospital, Parsons, Kansas, 1971.
4. HASAZI, J. E., & HASAZI, S. E. Effects of teacher attention on digit-reversal behavior in an elementary school child. *J. Appl. Behav. Anal.*, 1972, **5**, 157-162.
5. KIRBY, F. D., & SHIELDS, F. Modification of arithmetic response rate and attending behavior in a seventh-grade student. *J. Appl. Behav. Anal.*, 1972, **5**, 79-84.
6. LOVITT, T. C., & CURTISS, K. A. Effects of manipulating an antecedent event on mathematics response rate. *J. Appl. Behav. Anal.*, 1968, **1**, 329-333.
7. LOVITT, T. C., & ESVELDT, K. A. The relative effects on math performance of single-versus multiple-ratio schedules: A case study. *J. Appl. Behav. Anal.*, 1970, **3**, 261-270.
8. NOLEN, P. A., KUNZELMAN, H. P., & HARING, N. G. Behavioral modification in a junior high learning disabilities classroom. *Except. Child.*, 1967, **34**, 163-168.
9. SPENCE, J. T. Verbal reinforcement combinations and concept-identification learning: The role of nonreinforcement. *J. Exper. Child Psychol.*, 1970, **85**, 321-329.
10. WILLIAMS, B. R. Effects of verbal reinforcement combination on children's responses to blank trials. *J. Exper. Child Psychol.*, 1972, **14**, 30-42.
11. WOLF, M. M., GILES, D. K., & HALL, R. V. Experiments with token reinforcement in a remedial classroom. *Behav. Res. Ther.*, 1968, **6**, 51-64.

California School for the Deaf
3044 Horace Street
Riverside, California 92506

Parsons Research Center
Parsons State Hospital
and Training Center
Parsons, Kansas 67357

THE DETERMINATION OF LOCUS OF CONTROL IN A
GERIATRIC POPULATION AND A SUBSEQUENT TEST
OF THE SOCIAL LEARNING MODEL FOR
INTERPERSONAL DISTANCES*

Emory University

MARSHALL P. DUKE, JOYCE SHAHEEN, AND STEPHEN NOWICKI, JR.

SUMMARY

An attempt was made to measure locus of control in a geriatric population and to apply this measurement to the social learning model for interpersonal distance. Results suggested that the elderly group studied were no more external than middle-aged adults. This was discussed from several theoretical points of view. Interpersonal distance results, although not in direct support of theory, provided a source for further development and alteration of the model.

A. INTRODUCTION

In an attempt to bring some order to the existent chaos in the interpersonal distance literature, Duke and Nowicki (4) have proposed and provided evidence for (4, 11) a social learning approach to the phenomenon. Briefly, this position holds that generalized expectancies, such as locus of control, play a mediational role in interpersonal distancing decisions when an individual possesses relatively few specific experiences for interaction with a given type of stimulus person. Duke and Nowicki have termed stimuli for which there are specific experience bases available, Type SE stimuli, and those for which no specific expectancies are available, Type GE stimuli. In a series of four studies, it has been shown that when stimuli are presented and subjects are asked for their preferred interpersonal distance from these stimuli, locus of control plays a part for Type GE stimuli, but has no differential effect for Type SE. Specifically, it has been found that externals prefer greater distances from Type GE stimuli than internals, but that there is no difference between these groups for Type SE stimuli. This increased distancing on the part of externals has also been reported by Tolor, Brannigan, and Murphy (15).

* Received in the Editorial Office on November 19, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

The research to this point has dealt primarily with elementary, high school, and college students, and results have been in support of the social learning model over these age groups. The model, however, has never been explored in the geriatric population. With almost one in 10 Americans being at or over 65 years of age, this deficit in research seems particularly dismaying. The purpose of the present study may be seen as threefold. First, an attempt was made to assess locus of control orientation in a geriatric sample. Secondly, the authors have sought to determine whether it is possible to measure preferred interpersonal distance in this age group. Thirdly, an attempt was made to determine whether the social learning model for interpersonal distance, which applies to younger age groups, would hold for the elderly. The basis for directional expectations for each of these purposes will be developed below.

Theoretically and empirically, it has been predicted and found that people become more internal with age. Results specific to this relationship have been reported by Nowicki and Strickland (13) and Nowicki and Duke (12). It seems that, regardless of the measure used, subjects tend to be more internal, the older the group examined. From the point of view of social learning theory, it may be expected that the relationship between locus of control and age is not linear but curvilinear, for as people age the degree to which they can control what happens to them diminishes, and realistically, events are in the hands of powerful others, etc. One would expect, given this line of reasoning, that locus of control orientation among elderly persons would be significantly more external than among younger age groups.

A review of some theories of aging, however, yields differential points of view as well as alternate predictions. For example, the "activity theory" (7) implies that older people are basically the same as middle-aged persons with similar psychological and social needs. This view maintains that the decreased social interaction and interpersonal control of the elderly is not desired by the aged themselves. The optimal pattern is to maintain the activities of middle age and to resist the pressures of the social world. If this theory is accurate, one would expect the locus of control scores of a geriatric population to be no different from that of a middle-aged sample.

Still another theory of aging, however, termed the "disengagement theory" (2), yields another view. Cumming and Henry consider an elderly person to have reached a new developmental stage characterized by altered relationships and decreased social interaction. Their line of thinking (similar to social learning theory) seems to indicate that the complex variables operating on an elderly person would cause him to feel that his reinforcements would be

less contingent on his own behavior than they were at an earlier age. Thus on the basis of their physical liabilities and psychosocial change inherent in aging, it would be expected that geriatric subjects would be more external than middle-aged and younger adults.

The extension of interpersonal distance research to a elderly population attempted in the present study is the first of its kind. Previous research, reviewed elsewhere (4, 9), has only dealt with children and young adults (primarily college students). Further, until recently, there has been no psychometrically sound measure for interpersonal distance usable across a wide age range. As a result of this problem Duke and Nowicki (4) developed the Comfortable Interpersonal Distance Scale (CID) which has been used with preschoolers (5), black and white elementary and high school students (4, 10), white college students (4), black college students (8), middle-aged adults (6), and female hospitalized mental patients (3). In all of these studies it was found that differential and reliable distance preferences were obtained with use of the scale. It was thus expected that it would be possible to obtain similar differential distancing among the geriatric population.

Given that it was possible to measure locus of control and interpersonal distance in the geriatric population, the last goal of the study became a test of the social learning model proposed by Duke and Nowicki (4). It was expected that for Type SE stimuli, there would be no difference between internals and externals in terms of preferred distance from approach stimuli. For Type GE stimuli (those for which there are no specific expectancies assumed available) externals would prefer greater distances than internals.

B. METHOD

1. *Subjects*

Subjects were 66 female (not enough males were available to comprise a suitable group) residents of a complex for elderly and handicapped persons in a large southern metropolitan area. This sample was gathered from among 82 who were asked to volunteer for the study. Ages ranged from 65 to 90 with a mean age of 78.5 years. All were Caucasian.

2. *Measures*

Locus of control orientation was measured by a revised form (12) of the Adult Nowicki-Strickland Locus of Control Scale (ANSIE). Modification of the ANSIE-Form NC (noncollege adults) was labelled ANSIE-Form G (Geriatric) and consisted of 38 items which were to be answered either "yes"

or "no." These items were derived from the ANSIE-Form NC. Alterations consisted chiefly of changing verb tenses into past tense and interchanging the words children and parents in several items. For example, a Form NC question read "Do you feel that most of the time parents listen to what their children have to say?"; in Form G it read, "Do you feel that most of the time children listen to what their parents have to say?" Two questions dealing with situations at home were deemed inappropriate and were deleted from Form G. In total, then, of the 40 items on Form NC, two were deleted, and of the remaining 38, only six were changed. The ANSIE can be understood by adults with as low as a fifth grade reading ability. Satisfactory reliability and validity have been demonstrated for the ANSIE. With three samples of college students and middle-aged adults, internal consistency estimates ranged from .65 to .81. Test-retest reliability for 58 college students tested four weeks apart was .86. [Further specifics regarding these figures and the construct validity of the scale are included in Nowicki and Duke (12)].

Preferred interpersonal distance was measured with the Comfortable Interpersonal Distance Scale (CID). This is a simple paper and pencil measure in the form of a two dimensional plane with eight radii emanating from a common point. Each radius is associated with a randomly numbered "entrance" to what is presented as an imaginary "round room." Subjects are told about various kinds of people (stimuli) who will be entering the room and approaching the center where the subject imagines himself to be standing. They are asked to place a mark on the line leading from the entry door to the center to indicate the point at which they think they would like the approacher to stop advancing toward them. Scores are expressed as the distance, in millimeters, from S's mark to the center of the room. The psychometric properties of this scale have been reviewed elsewhere (4); and it has been found to be reliable and valid over a wide age range of subjects.

3. Procedure

Both the ANSIE and the CID are group administerable, but were administered individually in the present study. A 20 to 30 minute interview was held with each S. Initially Ss were given a brief introduction in which the 22-year old female college student experimenter stated that she was taking a survey of attitudes for a psychology course at a nearby college. A general information questionnaire was then administered which asked for demographic variables such as age, number of children, amount of time at the nursing home, and number of activities in which the subject participated.

There were 15 activities on the checklist, all of which were sponsored by or approved by the nursing home.

The ANSIE-Form G was then administered. Ss were instructed to answer either "yes" or "no" depending upon what they believed. All Ss were asked if they wished the questionnaire to be read to them, and most chose oral administration because of vision-related reading difficulties. Following the ANSIE, Ss received two copies of the CID with the following instructions:

I want you to imagine that this picture represents a round room with eight doors and that you are standing in the center of the room. I am going to tell you about several persons who will be entering through the doors and walking towards you. I want you to make a mark on the line leading from the door through which the person enters to the center where you are standing. Make this mark at the place where you think you would want the person I describe to stop coming toward you.

Subjects were always instructed to "face" the entrance door (thus a different "door" was used for each stimulus). Stimuli were chosen on the basis of whether they were assumed to be Type SE or Type GE. They were administered in a predetermined random order to all Ss and included the following: a stranger (GE), a stranger of the same age and sex of subject (GE), a stranger of the opposite sex and same age (GE), a stranger 25 years of age (GE), a staff member of the opposite sex (SE), a specific doctor (SE), a specific minister (SE), a 10-year-old child (SE) one of the subject's own children (SE), and a specific nurse (SE).

C. RESULTS

The mean locus of control score for the geriatric group was 8.74 ($SD = 3.59$) which is not different from the mean score for college age adults of 9.06 ($SD = 3.89$) reported by Nowicki and Duke (12). Thus, the geriatric group appears to be no more external than a much younger group of adults. Further, by comparison with previous data obtained with high school students, the geriatric population is actually more internal (mean score for ninth and tenth grade = 13.06, $SD = 4.50$).

Interpersonal distance results as a function of stimulus are presented in Table 1. As can be seen definite differential distances were obtained, indicating that the elderly subjects, as other age groups, were sensitive to stimulus variation. As found in previous studies, strangers were preferred at significantly greater distances than those with whom subjects were familiar. Mean

distance for Type GE stimuli, 67.85 mm, was significantly greater than for Type SE stimuli, 21.80 mm ($t = 4.76, p < .01$).

On the basis of locus of control scores, subjects were divided into internals ($n = 33$) and externals ($n = 33$). Preferred distances from each of the stimuli were then calculated according to locus of control orientation. Contrary to expectation, however, for Type GE stimuli there was no difference between internals and externals (internals' mean distance over all Type GE stimuli = 65.60 mm; for externals, 70.10). For Type SE stimuli, where no differences were expected, internals' mean distance was 22.38 mm; for externals, 21.22 mm. In neither case was the internal-external difference significant. Results indicated, then, that predictions based upon the social learning model for interpersonal distance were not supported in the present sample.

Correlations between locus of control score and demographic variables were nonsignificant. Among these variables only age was related to any other measure. Specifically, there was a not surprising inverse correlation ($-.37$) between age and number of activities. In addition, a positive relationship ($.36$) was obtained between age and preferred distance from strangers.

D. DISCUSSION

With regard to the locus of control results *per se*, there are two alternative explanations. Initially it appears that the "activity" theory of aging has been supported by the data; i.e., elderly subjects score in much the same way as middle-aged or younger adults. Further consideration of the findings, however, may suggest that the initial theoretically based hypothesis that elderly subjects would tend to be more external than younger adults is still viable. Rotter [see Brissett and Nowicki (1)] has reported that the population is becoming, on the average, more external as years go by. Whether this be due to increased complexity of life and governmental control (external) is beyond the scope of the present study. It may be that the locus of control orientation of the present subjects, were it to have been measured when they were young, might have been significantly more internal than it is at present. In other words, the question becomes, "What was the locus of control of the present sample in the early 1900's?" It is conceivable that the mean locus of control for the present subjects may have been more internal at age 25 than their present score of 8.74, which would then be more external as was expected. The determination of this "historical" locus of control is necessary to determine which of the above explanations is most viable. An approach to scoring locus of control similar to that for need achievement developed by McClelland and his associates is currently being developed by the authors

for this purpose. Until this can be applied to the present sample, however, the geriatric results must remain equivocal. Moreover, since locus of control scores of those from the 25 to 65 year age group are nearly nonexistent, there is also the possibility that the relation between age and locus of control orientation is nonlinear. Until further testing is completed, this too must remain a *post hoc* question.

Differential interpersonal distancing as a function of stimulus was clearly demonstrated among elderly subjects. Thus, as has been found in all other age groups, subjects were sensitive to interpersonal differences and altered their preferred interpersonal distance accordingly. As seen in Table 1, as

TABLE 1
MEAN COMFORTABLE INTERPERSONAL DISTANCE SCORES (IN MM)
FROM APPROACH STIMULI

Stimuli	Mean	SD
Stranger	71.76	18.88
Stranger = sex = age	58.84	22.81
Stranger \neq sex = age	73.23	12.52
Stranger 25 years old	63.34	21.76
Staff member = sex	17.42	12.91
Staff member \neq sex	26.86	15.89
Doctor	16.78	15.89
Minister	16.52	11.74
Stranger 45 years old	72.10	17.32
10-year-old child	30.76	27.64
Friend = sex	11.42	11.33
Friend \neq sex	24.3	26.05
One of your own children	8.15	4.62
Nurse	22.21	22.53

Note: Explanation of symbols is as follows: = is "same"; \neq is "different."

expected, those stimuli with whom the Ss were familiar were allowed closer than those who were cast as strangers. Since the CID had not been used previously with geriatric groups, the present data extend the construct validity of the instrument.

At first glance, the results dealing with the test of the social learning model for interpersonal distance (4) do not support the model. Although differential distancing was obtained among stimuli, for Type GE stimuli no differences were found between internals and externals. It would seem that locus of control was not related to distancing among the elderly subjects; i.e., it played no role in differential distancing. This was most surprising in view of the fact that the invocation of locus of control as a mediating variable for Type GE stimuli has been found in at least four previous experimental tests of the Duke-Nowicki model (4, 6, 11).

Social learning theory, however, may provide the explanation for the results. Rotter (14, p. 29) has stated "... as experience in a specific situation accumulates, the likelihood of a given behavior occurring becomes increasingly a function of one's reinforcement experience in that situation ... Predictions about a behavior early in a learning sequence must give greater attention to the individual's reinforcement history in previous situations that elicited behaviors oriented toward similar goals [generalized expectancies]."

Rotter's point may be interpreted to mean that, generally, the younger an individual, the earlier he is in his lifelong learning sequence and the fewer the specific expectancies he would have upon which to base his behaviors in specific situations. Therefore, one would theoretically expect that younger persons would rely more on generalized expectancies than older persons. Thus, from this social learning theory framework, the present results may be understandable. If the above reasoning is correct, one would expect fewer correlates of locus of control, the older the subject population. In any case, it suggests that the social learning model needs to be changed to include age as a factor. Of course, this in itself must become the object of extensive research. For the present data, however, the lack of locus of control/distance relationships for Type GE stimuli may indicate that the assumptions made by the authors concerning stimulus type were in error. Data suggest, in fact, that for the geriatric population there were no Type GE stimuli presented. Elderly subjects have had, it appears, enough experience in dealing with "strangers" that they actually have specific expectancies available for distancing decisions with regard to such stimuli. They do not, as younger age groups have been seen to do, base their decisions upon generalized expectancies; they do however, discriminate among stimuli as evidenced by the differential distancing observed.

Of course, the soundness of the explanation offered here for the failure to support the social learning model for interpersonal distance must remain open to empirical examination. It is intriguing to consider, however, that social learning theory, much of the support for which is obtained from studies with children and college age adults, may be differentially applicable to older subject populations. It would seem that many of the basic findings reported in the literature would well be re-evaluated in the geriatric population to determine whether results once thought generalizable to people in general are, in actuality, age-related.

REFERENCES

1. BRISSETT, M., & NOWICKI, S. Internal versus external control of reinforcement and reaction to frustration. *J. Personal. & Soc. Psychol.*, 1973, 25, 35-44.

2. CUMMING, E., & HENRY, W. H. *Growing Old: The Process of Disengagement*. New York: Basic Books, 1961.
3. DUKE, M., & MULLENS, M. Locus of control and interpersonal distance in schizophrenics, non-schizophrenic patients, and normals. *J. Consult. & Clin. Psychol.*, 1973, **41**, 230-234.
4. DUKE, M., & NOWICKI, S. A new measure and social learning model for interpersonal distance. *J. Exper. Res. Personal.*, 1972, **6**, 119-132.
5. DUKE, M., & WILSON, J. A note on the measurement of interpersonal distance in preschool children. *J. Genet. Psychol.*, 1973, **123**, 361-362.
6. DUKE, M., JOHNSON, K., & NOWICKI, S. Differential effects of authority role cues on interpersonal distance. Unpublished study, Emory University, Atlanta, Georgia, 1972.
7. HAVIGHURST, R., NEUGARTEN, B., & TOBIN, S. Disengagement and patterns of aging. In B. Neugarten (Ed.), *Middle Age and Aging*. Chicago: Univ. Chicago Press, 1968.
8. JOHNSON, E., DUKE, M., & NOWICKI, S. Interpersonal distance among black college students. Paper presented at Southeastern Psychological Association meetings, Atlanta, Georgia, 1972.
9. LETT, E., CLARK, W., & ALTMAN, I. A propositional inventory of research on interpersonal distance. Research Report, Naval Medical Research Institute, Bethesda, Maryland, 1969.
10. NOWICKI, S., & DUKE, M. The use of the Comfortable Interpersonal Distance scale in high school students. *Psychol. Rep.*, 1972, **30**, 182.
11. ———. A further test of the social learning model for interpersonal distance. Paper presented at meetings of Southeastern Psychological Association, New Orleans, Louisiana, 1973.
12. ———. A locus of control scale for college as well as noncollege adults. *J. Personal. Assess.*, in press.
13. NOWICKI, S., & STRICKLAND, B. A locus of control scale for children. *J. Consult. & Clin. Psychol.*, 1973, **40**, 148-154.
14. ROTTER, J., CHANCE, J., & PHARES, E. *Applications of a Social Learning Theory of Personality*. New York: Holt, Rinehart & Winston, 1972.
15. TOLOR, A., BRANNIGAN, G., & MURPHY, V. Psychological distance, future time perspective, and internal-external expectancy. *J. Project. Techn. & Personal. Assess.*, 1970, **34**, 283-294.

Department of Psychology

Emory University

Atlanta, Georgia 30322

INTERPERSONAL COMPARISON PROCESSES IN CHOICE DILEMMA RESPONDING*

Hope College

DAVID G. MYERS¹

SUMMARY

Reliable group-induced response changes have been observed on choice dilemma items and, in extensions of this research, with other stimulus materials as well. The search for a theoretical explanation of these findings requires analysis of the processes that determine pregroup responses.

It has been proposed that interpersonal comparison considerations determine initial responses to choice dilemma items by inducing the subject to compromise between his perception of the group norm and his own ideal. This study demonstrated that the order of measurement of "self," "other," and "admired" responses significantly affects these responses. The findings are interpreted as contrary to the interpersonal comparison assumption that initial choices are an attempt to present oneself favorably, but consistent with the idea that *after* one has acted, there is a tendency to perceive one's action as more admirable than that of the average peer.

A. INTRODUCTION

Recent research indicates that discussion of choice dilemma items and of certain other stimulus materials tends to enhance choice tendencies initially valued in the subject population (5). Although the ultimate goal of this research literature is to yield generalizations concerning basic processes and effects of discussion in small groups, it is recognized with Cartwright (1) that "the problem of generalization . . . cannot be solved until the theoretical significance of the experimental findings is clearly understood" (p. 374) and that "the search for a suitable theoretical home for the findings established by the research on choice dilemmas will require careful attention to the con-

* Received in the Editorial Office on November 26, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This work was supported by grants to the author from the National Science Foundation (GS 2891, GS 2891A#1). Requests for reprints should be sent to the author at the address shown at the end of the article.

crete processes that determine both initial choices and changes in these choices" (p. 376).

The present study examines interpersonal comparison assumptions regarding choice dilemma responses. Levinger and Schneider (3) and Pruitt (9) reason that when responding initially the individual is faced with a conflict between his ideal preference on the one hand and the assumed group norm on the other. His response, made in ignorance of the actual preferences of others, is a compromise between his inner ideal and the presumed peer norm. Group discussion may yield response change because it serves to redefine a subject's perception of the group norm which is discovered to be more in the valued direction than imagined (3), or because the subject is "released" by his observation of someone who models his ideal in a more extreme form (9).

Support for assumptions underlying interpersonal comparison theories comes from experiments that demonstrate that if, after responding to choice dilemma items, subjects are asked to go back over the items and guess how their average peer would respond and then to go back over the items a third time and indicate what response they would admire most, the subject's own response tends to end up midway between his subsequent estimate of the typical peer response, on the neutral side, and what he marks as the response he would most admire, on the more extreme side (*cf.* 5).

The fact that subjects estimate a more neutral group norm and a more extreme ideal *after* making their own initial choice does not necessarily indicate that they have made their own initial responses so as to be midway between their ideal and the assumed group norm (i. e., that interpersonal comparison considerations determine initial choices). What effect might there be if they estimated the social norm *before* making their own response? Comparison theory would predict at least equivalent self *vs.* assumed other (S-O) difference because of the obvious salience of the perceived norm at the point of the individual's own decision. But to the contrary, McCauley, Kogan, and Teger (4) found that this reduces the S-O difference. With attitude measures, Myers and Bishop (6) found others rated as less extreme than self, using SO order of measurement, and Eisinger and Mills (2) found no difference using OS order. Similarly, Pruitt (8) reported that when subjects were asked to label their previously made response as risky or cautious, they tended to describe it as risky on risk-oriented items. But if subjects subjectively defined what probability responses were risky and cautious *before* making their own response, they tended to mark a response they had labelled cautious. These data suggest that a subject's perception of himself as relatively risky may be an experimenter-elicited postdecisional phenomenon.

If, contrary to possible alternative interpretations of the S-O difference, interpersonal comparison processes are operating at or before the moment of own initial choice (i. e., subjects are viewing and presenting themselves favorably relative to others), then reordering the measurements should not affect the S, O, and A (admired) responses. Since work by McCauley, Kogan, and Teger has provided some suggestive trends, the present experiment attempts to extend this work by examining the possible effects of the order in which these measures are taken.

B. METHOD

1. Subjects

The participants were 145 introductory psychology students at Hope College. The experiment was conducted in two classes as a demonstration prior to a social psychology lecture.

2. Materials

Three choice dilemmas items which had produced strong S-O-A differences in past research were employed [items 6, 8, and 11 in Pruitt (9)]. The sample item below illustrates the format.

Mr. F. is currently a college senior who is very eager to pursue graduate study in chemistry leading to the Doctor of Philosophy degree. He has been accepted by both University X and University Y. University X has a world-wide reputation for excellence in chemistry. While a degree for University X would signify outstanding training in this field, the standards are so very rigorous that only a fraction of the degree candidates actually receive the degree. University Y, on the other hand, has much less of a reputation in chemistry, but almost everyone admitted is awarded the Doctor of Philosophy degree, though the degree has much less prestige than the corresponding degree from University X.

Imagine that you are advising Mr. F. Listing below are several probabilities or odds that Mr. F. would be awarded a degree at University X, the one with the greater prestige.

Please check the *lowest* probability that you would consider acceptable to make it worthwhile for Mr. F. to enroll in University X rather than University Y.

Subjects were presented with 10 response alternatives ranging from "If the chances are 1 in 10 that Mr. F. would receive a degree from University X" to "if the chances are 10 in 10 that Mr. F. would receive a degree from University X (i. e., only if Mr. F. is certain to receive a degree from University X)."

3. Procedure

The order of measurement was manipulated by constructing four different sets of questionnaire booklets. Subjects were randomly assigned to one of these four conditions by alternating the type of questionnaire within the stack of questionnaires distributed to subjects.

One-half of the subjects received booklets with cover instructions to indicate their own choice (S response). These subjects then came to a new page of instructions followed by a new set of the same three items. These instructions either requested the subject "to guess what you think the average of majority responses by other students here would be to these three items" (O response), or to indicate "what response would you admire most" regardless of what advice he or most others might prefer (A response). The other half of the subjects indicated S response *after* indicating, on a previous set of items, their O or A responses. Thus, four conditions existed: SO, SA, OS, and AS.

C. RESULTS

Data from across the three items were averaged to yield a single S score and O or A score for each subject. Table 1 presents the means of these scores for each form of the questionnaire. Table 1 indicates a large S-O difference when these measures were taken in the usual SO order ($t = 6.37$).² This replicates results of past studies. However, when the order of measurement was reversed (OS), the S-O difference was virtually eliminated ($t < 1$). McCauley, Kogan, and Teger (4) found a nonsignificant tendency for subjects in an SO condition to see others as more cautious than did subjects in the OS order. This tendency may be seen in the present data as well; the greater perceived cautiousness of others in the SO order is a significant contributor to the greater S-O difference in that condition ($t = 2.36$).

Table 1 also indicates the usual strong S-A difference when Self scores are measured first ($t = 4.14$), a nonsignificant trend in the same direction when Admired scores are measured first ($t = 1.60$), and a nonsignificant difference between these two differences ($F = 2.16$, $df = 1, 70$ for the interaction between condition and Self *vs.* Admired response). Thus the significant S-A difference for the SA order was reduced about in half to a nonsignificant difference for the AS order.

An analysis of variance examining effect of order of measurement on Self

² Admired scores, recorded at the end of this condition to replicate the usual SOA treatment, averaged 3.55. This mean differed significantly from the Self mean of 4.25 ($p < .05$), replicating the S-O-A differences of previous studies.

TABLE 1
MEAN SELF/OTHER AND SELF/ADMIRABLE RESPONSES PER ITEM

Condition	N	Self	Other	Admired	Difference
<i>Self (S) and Other (O) responses</i>					
SO order	37	4.25	5.96		1.71*
OS order	36	4.89	5.02		.13
<i>Self (S) and Admired (A) responses</i>					
SA order	37	5.18		3.84	-1.34*
AS order	35	4.41		3.80	-.61

* $p < .001$.

scores (combining Self scores of the SA and SO conditions) revealed no significant effect ($F < 1$).

D. DISCUSSION

The elimination of the S-O difference by reversing the order of measurement casts doubt on the assumption that initial responses are determined by interpersonal comparison considerations (the desire to compromise between perceived norm and inner ideal). This finding is compatible with Pruitt's (8) finding that subjects present themselves as relatively risky only when labelling the social norm *after* making their own response. In the present study, Self responses were relatively unaffected by order of measurement. But subjects were more likely to imagine others were less in the Admired direction than Self if they had first indicated their Self response, than if their response was to estimate the group norm objectively. These data could be interpreted to indicate that initial decisions are not determined by the need to present oneself favorably relative to others. It appears more likely that rational considerations (the weighing of available arguments) determined initial responses. But *after* one has acted, there appears to be a tendency to create a positive image of one's action by labelling the average man as less admirable than oneself. This may provide the groundwork for subsequent interpersonal comparison effects in group discussion (*cf.* 7).

REFERENCES

1. CARTWRIGHT, D. Risk taking by individuals and groups: An assessment of research employing choice dilemmas. *J. Personal. & Soc. Psychol.*, 1971, **20**, 361-370.
2. EISINGER, R., & MILLS, J. Perception of the sincerity and competence of a communicator as a function of the extremity of his position. *J. Exper. Soc. Psychol.*, 1968, **4**, 224-232.
3. LEVINGER, G., & SCHNEIDER, D. J. A test of the "risk is a value" hypothesis. *J. Personal. & Soc. Psychol.*, 1969, **11**, 165-169.

4. McCauley, C., Kogan, N., & Teger, A. I. Order effects in answering risk dilemmas for self and others. *J. Personal. & Soc. Psychol.*, 1971, 20, 423-424.
5. Myers, D. G. Summary and bibliography of experiments on group-induced response shift. *JSAS Cat. Select. Doc. Psychol.*, in press.
6. Myers, D. G., & Bishop, G. B. Enhancement of dominant attitudes in group discussion. *J. Personal. & Soc. Psychol.*, 1971, 20, 386-391.
7. Myers, D. G., Bach, P. J., & Schreiber, F. B. Normative and informational effects of group interaction. *Sociometry*, in press.
8. Pruitt, D. G. "Walter-Mitty" effect in individual and group risk taking. *Proc., 77th Conven. APA*, 1969, 4, 425-426.
9. ———. Choice shifts in group discussion: An introductory review. *J. Personal. & Soc. Psychol.*, 1971, 20, 339-360.

Department of Psychology
Hope College
Holland, Michigan 49423

SOME DEVELOPMENTAL CHARACTERISTICS OF SCHEMATIC CONCEPT FORMATION*¹

Augusta College

ED M. EDMONDS

SUMMARY

Children ranging from six to 12 years of age were trained in an oddity task either with or without knowledge of results to distinguish 67% redundant patterns representing a schema from 67% redundant patterns representing different schemata. Schematic concept formation (SCF) was found to occur prior to age six and increase in efficiency to around age 11 or 12. This ability did not depend on knowledge of results and was not related to traditional measures of intelligence. Recent research indicates that the SCF task holds promise as a process measure of learning ability.

A. INTRODUCTION

It is the opinion of the writer that a schema is best understood as a statistically defined concept. Schematic concept formation (SCF) consists of abstracting the common elements or properties of a defined class into a schema. A considerable amount of evidence (e. g., 2, 4, 6, 8) exists that human adults can readily distinguish between members of different schema families and associate each instance with its appropriate schema family. The present study was designed to determine how SCF ability develops as a function of age under two conditions of reinforcement and to what extent this ability is related to a standard measure of intelligence.

Children ranging from six to 12 years of age were trained either with or without knowledge of results (KR) in an oddity discrimination task to distinguish patterns representing a schema family from patterns belonging to different schema families. In previous research using adults (4, 5) the effect

* Received in the Editorial Office on November 29, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The project reported herein was performed pursuant to a grant from the U. S. Office of Education, Department of Health, Education, and Welfare. The opinions expressed herein, however, do not necessarily reflect the position or policy of the U. S. Office of Education, and no official endorsement by the U. S. Office of Education should be inferred. The author wishes to acknowledge the cooperation extended by Anne Johnston and Sally Nicoll of the Episcopal Day School.

of KR was to indicate the relevant dimensions (schema) along which oddity was to be sought rather than to assist SCF *per se*. This same result was expected at these earlier age levels if SCF is a basic, spontaneous process which can be done with only the information in the stimuli themselves.

B. METHOD

1. Subjects

The Ss were 240 students enrolled in grades 1 through 6 at the Episcopal Day School, which is located in Augusta, Georgia. The 40 students enrolled at each of these six age levels were randomly assigned to two groups which are referred to as Group KR (knowledge of results condition) and Group NKR (no knowledge of results condition). Mental age variations were comparable at each of the chronological age levels.

2. Patterns

A computer program, VARGUS 7 (3, 9), has been developed which allows quantification of pattern populations in information terms and permits independent manipulation of several population parameters. The schema in these patterns is composed of particular column-height sequences favored by the transitional probabilities of a seven-element Markov process. Constraint redundancy is determined by the magnitude of the probabilities associated with the schematic sequences and so can be manipulated independently of the schema. The schema itself can be independently manipulated by varying the favored or most probable column-height sequence. In fact, a population of schemata (column-height sequences) can be defined and sampled. In addition, the pattern-generation procedure allows construction of nonsense forms to have schemata that have been provided neither by experience nor by heredity.

In the present study the VARGUS 7 computer program used four different most probable column-height sequences (MPs), designated pattern sets PS1, PS2, PS3, and PS4, to produce 67% redundant patterns containing 12 columns. These patterns had been used in previous research, and the MPs (schemata) did not differ in difficulty.

3. Procedure

The Ss received five training trials, each of which consisted of two similar forms and one different form (e. g., square, rectangle, triangle). On each trial the Ss were instructed to select the form that was not like the others. All Ss

correctly performed this task. Each S was then given a 20 page booklet with three nonidentical VARGUS 7 patterns printed on each page and appropriately instructed to select the pattern on each page that was "most different from" the other two patterns. Each page of the booklet contained two different PS1 patterns and a third pattern chosen at random from PS2, PS3, or PS4. Thus two of the patterns represented one schema, and the third pattern represented a different schema. The position of the third pattern in each three pattern set was randomly varied. Both groups were allowed 45 seconds to choose a pattern on each page. Group KR was then told which pattern was correct. Group NKR received no feedback. The intertrial interval was 25 seconds.

C. RESULTS AND DISCUSSION

A 2 by 6 (2 levels of KR by 6 age levels) analysis of variance based on the number of patterns identified correctly on the last three oddity trials indicated that the age main effect was significant ($F = 8.67$, $df = 5/228$, $p < .01$). The KR main effect and the interaction were not significant.

Comparisons among grade levels indicated that, except for the grade 5 and grade 6 comparison, all performance differences were significant ($p < .01$ for all comparisons). In other words, the performance of the first graders was significantly above chance, and performance significantly increased from grade level 1 through grade level 5 both with and without KR. The results thus indicate that SCF ability develops prior to age six but increases in efficiency until age 11 or 12. These findings are supported in an experiment by Aiken and Williams (1) which indicated no significant SCF performance differences between fifth graders and adults. Moreover, Aiken and Williams concluded that any performance variations among age levels reflected accuracy rather than strategy differences.

In the present study all performance comparisons between Groups KR and NKR were nonsignificant. This result is consistent with previous research (e. g., 4, 5, 6) and lends further support to the notion that schematic concept formation is a spontaneous process that occurs without need for supplementary information.

Correlations of performance by Groups KR and NKR with both IQ (Otis-Lennon Mental Ability Test) and mental age were not significant, ranging from .08 to .22. Shields, Gordon, and Evans (11) obtained only moderate relationships between SCF performance and traditional measures of intelligence. These data suggest that performance on the SCF task may be a mea-

sure of learning ability that is independent of academic achievement. The results of an experiment by Price and Evans (10) support this supposition. They found that SCF performance provided a better prediction of learning potential in disadvantaged students than did intellectual capacity. Price and Evans (10) believe that these and other related findings indicate that the SCF task may prove useful as a nonverbal and perhaps culture-independent measure of certain cognitive abilities.

REFERENCES

1. AIKEN, L., & WILLIAMS, T. A. A developmental study of schematic concept formation. *Devel. Psychol.*, 1973, **8**(2), 162-167.
2. EDMONDS, E. M., & EDMONDS, S. Schema mediation in categorization learning. *Psychon. Sci.*, 1969, **14**(4), 196.
3. EDMONDS, E. M., & EVANS, S. H. Prediction of schema learning by linear regression. *Psychon. Sci.*, 1966, **5**, 457-458.
4. EDMONDS, E. M., & MUELLER, M. R. Schema discrimination without external reinforcement. *Percept. & Motor Skills*, 1967, **24**, 436-438.
5. ———. The role of schemata in perceptual learning. *Psychon. Sci.*, 1967, **8**, 239-240.
6. ———. Prediction of mixed schema learning in a reproduction task. *Psychon. Sci.*, 1967, **8**, 533-534.
7. EDMONDS, E. M., EVANS, S. H., & MUELLER, M. R. Learning how to learn schemata. *Psychon. Sci.*, 1966, **6**, 177-178.
8. EDMONDS, E. M., MUELLER, M. R., & EVANS, S. H. Effects of knowledge of results on multiple schema discrimination. *Psychon. Sci.*, 1966, **6**, 377-378.
9. EVANS, S. H. VARGUS 7: Computed patterns from Markov processes. *Behav. Sci.*, 1967, **12**, 323-328.
10. PRICE, J., & EVANS, S. H. Schematic concept formation as a predictor of success in a remedial education program. Paper presented at the Southwestern Psychological Association, Oklahoma City, Oklahoma, April, 1972.
11. SHIELDS, R. V., GORDON, M. A., & EVANS, S. H. Schematic concept formation in relationship to mental ability in adolescents. *Psychon. Sci.*, 1969, **17**, 361-362.

Department of Psychology

Augusta College

Augusta, Georgia 30904

ALIENATION AS MEASURED BY THREE DIFFERENT INSTRUMENTS*

Institute for Human Development, Fairfield University

ALEXANDER TOLOR

SUMMARY

Three instruments—namely, the Gould Manifest Alienation Measure, Rotter's Internal-External scale, and Dean's Alienation Measure—were administered to 41 male and 69 female students because they reflected different traditions and conceptualizations of the alienation syndrome. It was found that the three instruments intercorrelated significantly for both sexes and therefore seemed to measure much in common. However, the three subscales on the Dean Alienation measure appeared to tap different aspects of the alienation concept for males, but not for females.

A. INTRODUCTION

The concept of alienation has not only been deeply rooted in sociological thought (e. g., 3, 8, 9), but has also played a crucial role in the formulations of psychological theorists and researchers (e. g., 4, 5, 7). More recently, it has been the focus of a number of commentaries on the contemporary cultural scene which have described the quality of human relationships (e. g., 1, 6, 10). While there are subtle differences and fine nuances of meanings that have been assigned to the term by various authors, and although it is quite likely that the concept encompasses several different dimensions rather than being a unitary phenomenon, a nuclear meaning seems nevertheless to be extractable despite these qualifications. When stripped to its bare essentials, the alienation syndrome seems to have as a common denominator an experienced lack of coordination with existing social structures, specific reference groups, or the self. In addition, alienation implies that the individual tends to perceive people as oppressive, impersonal, manipulative and uncaring. The present study was a methodological inquiry into the ways in which this experienced estrangement of self to the social world may be measured. More specifically, the study attempted to determine the relationship between

* Received in the Editorial Office on November 29, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

several instruments of alienation growing out of different traditions and theoretical perspectives. One of the measures studied, the Dean (2) Alienation scale, is grounded in a sociological framework. The other two, the Gould (6) Manifest Alienation Measure (MAM) and Rotter's (11) Internal-External (I-E) scale, are both more psychologically based. Of interest, therefore, was the question of the degree to which these three alienation scales, derived as they are from different theoretical positions, correlated with one another.

B. METHOD

1. *Instruments*

The I-E scale (11) is a well-validated instrument which determines the degree to which an individual regards his successes or failures to be controlled by fate or other circumstances over which he has little control, as opposed to his viewing his successes or failures to be a function of his own behavior. It consists of 29 items, six of which are buffer statements that are not scored. The higher the overall score the more external is the S's expectancy of reinforcement.

Gould's (6) MAM is composed of 20 items presented in a Likert-type format. Based on factor analytic investigations, the items have been found to cluster together with diverse populations. The MAM has demonstrated construct validity and has been found to be predictive of certain types of behavior and perceptions. The items are based on a constellation of attitudes characterized by pessimism, cynicism, apathy, distrust, and emotional distance.

The Dean Alienation scale (2) consists of 24 items and has three major components: namely, the Powerlessness, Normlessness, and Social Isolation subscales. "Powerlessness" refers to such phenomena as a worker feeling helpless in determining his economic destiny or people's felt inability to influence important aspects of their lives. "Normlessness" refers to the absence of values that might give purpose to life or the experience of conflicting codes of behavior. "Social Isolation" pertains to a feeling of separation from the group or its standards. The reported range of intercorrelations among the subscales is .41 to .67. This measure has already been used in a substantial number of studies dealing with the alienation syndrome.

2. *Procedure*

The three alienation measures were group administered to 42 male and 71 female undergraduate students using packets in which the I-E scale appeared

first, the MAM second, and the Dean Alienation scale last in order.¹ The volunteer respondents were requested not to record their names; absolute anonymity was further assured by asking for no other personal identifying information, except for the sex of the respondent, the latter permitting data treatment separately for male and female students.²

C. RESULTS AND DISCUSSION

Table 1 presents the scores achieved by male and female students separately on all research instruments that had been administered. The only notable sex difference obtained disclosed a significantly ($t = 2.22, p < .05$) greater external expectancy for females ($M = 13.80, SD = 4.07$) as compared with males ($M = 11.90, SD = 4.41$). It should be noted that this sex difference in I-E scores is not consistent with the normative data published by Rotter (11) which revealed only a minimal sex difference in internality-externality.

The intercorrelations of all measures of alienation are reported for both sexes separately in Table 2. The results for males and females closely paralleled each other in revealing that most of the alienation scales correlated significantly with one another. The three major alienation scales—namely, Rotter's I-E scale, Dean's Alienation (Total) scale, and Gould's MAM—produced quite substantial intercorrelations for both sexes. However, the Dean subscales disclosed some variations for the sexes. For one thing, only for females did these components correlate significantly with the total score in a manner similar to that reported by Dean (2). In the case of the male sample, neither Social Isolation nor Normlessness related significantly to the total Dean Alienation score. For another, with males, externality failed to relate to two of the Dean components—i. e., Social Isolation and Normlessness—while with females, externality failed to relate significantly only to Normlessness. Finally, it is noteworthy that for men, Dean's Normlessness subscale was unrelated to Powerlessness and Social Isolation, whereas for women, Normlessness was significantly related to these components. It is, therefore, quite likely that Normlessness has a specific meaning that differs for the sexes.

In sum, the results suggest that these three major scales of alienation, although not measuring identical aspects of the alienation syndrome, do indeed have much in common. Individuals who do not perceive their personal

¹ Since not all students completed, as they were instructed, all of the administered tests, the final analyses were based on the scores of the 41 male and 69 female Ss on whom complete data were available.

² The assistance of Denis D'Amico, Margaret O'Marra, and Marie Cramer with data collection and analyses is gratefully acknowledged.

TABLE 1
SCORES OBTAINED BY 41 MALE AND 69 FEMALE STUDENTS
ON SEVERAL ALIENATION MEASURES

Measure	Male		Female	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
I-E (Rotter)	11.90	4.41	13.80	4.07
MAM (Gould)	74.05	13.40	70.30	14.53
Social Isolation (Dean)	17.85	5.32	19.35	5.11
Powerlessness (Dean)	17.83	5.23	18.13	4.24
Normlessness (Dean)	11.24	4.67	10.45	3.48
Total (Dean)	46.93	11.25	47.93	10.07

Note: I-E = Internal-External scale; MAM = Manifest Alienation Measure.

successes or failures to be a function of their own behavior generally score higher on the Dean Alienation scale and also experience more estrangement on Gould's MAM, which defines alienation from the point of view of the actor rather than some societal norm or hypothesized ideal state.

With respect to the Dean Alienation scale, its subscales, it is suggested, seem to measure different facets of the alienation concept for men but not for women. Dean (2) indicated that Normlessness, derived from Durkheim's concept of anomie, may include the dual notion of "purposelessness," which is defined as an absence of values that would help organize the direction of

TABLE 2
MATRIX OF INTERCORRELATIONS FOR ALL ALIENATION MEASURES
FOR MALE AND FEMALE STUDENTS^a

Measures	I-E	MAM	Dean Social Isolation	Dean Powerlessness	Dean Normlessness	Dean total
I-E		.53***	.17	.51***	.17	.39*
MAM	.49***		.37*	.59***	.44**	.63***
Dean Social Isolation	.30*	.52***		.46**	.18	.76***
Dean Powerlessness	.34**	.65***	.52***		.29	.81***
Dean Normlessness	.19	.59***	.26*	.45***		.64***
Dean total	.36**	.74***	.82***	.84***	.67***	

Note: I-E = Rotter's Internal-External scale; MAM = Gould Manifest Alienation Measure.

^a The correlations for males appear above the diagonal, and those for females appear below the diagonal.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

one's life, and "conflict of norms," which is defined as difficulty engendered by exposure to conflicting norms. In view of the observation that for this sample of males Normlessness did not correlate with externality, Social Isolation, or Powerlessness, but did correlate with the MAM and the Dean total scale score, it is possible that men respond particularly to one of these dual aspects of Normlessness and not much to the other. On the other hand, since women's Normlessness scores related significantly to all the other variables, except externality, women appear to respond more similarly to both facets of the Normlessness concept than do men. It will take further research to elucidate this possibility and to determine, in the event that it is supported, whether it is the "purposelessness" or "conflict of norms" aspect that is primarily responsible for the divergent results in males.

A final comment concerning the major finding of high intercorrelations for the three main alienation measures seems in order. If one accepts Seeman's (12) view that there is a continuum of "in-touchness" to "out-of-touchness," with more effective persons being in close touch with themselves and being open to their experience with the world, and less effective persons being out of touch with themselves and closed off to their experience with the world, then a variety of measures that deal with this mode of functioning, whether they focus primarily on inner experiences or focus primarily on conditions that are related to the outer world, would result in similar subjective experiences of "in-touchness" or "out-of-touchness." It is precisely this phenomenon that the various alienation instruments seem to measure.

REFERENCES

1. BROWN, W. N. Alienated youth. *Ment. Hyg.*, 1968, **52**, 330-336.
2. DEAN, D. G. Alienation: Its meaning and measurement. *Amer. Sociolog. Rev.*, 1961, **26**, 753-758.
3. DURKHEIM, E. *Suicide: A Study in Sociology*. Glencoe, Ill.: Free Press, 1951.
4. ERIKSON, E. H. The problem of ego identity. In "Identity and the life cycle." *Psychol. Issues*, 1959, **1**(1), 18-171.
5. FROMM, E. *The Sane Society*. New York: Holt, Rinehart & Winston, 1955.
6. GOULD, L. J. The alienation syndrome: Psychosocial correlates of behavioral consequences. Doctoral dissertation, University of Connecticut (No. 66-848, University Microfilms, Ann Arbor, Michigan, 1964).
7. KENISTON, K. *The Uncommitted: Alienated Youth in American Society*. New York: Harcourt, Brace & World, 1965.
8. MARX, K. *Capital, the Communist Manifesto and Other Writings by Karl Marx* (ed. by M. Eastman). New York: Modern Library, 1932.
9. MERTON, R. K. *Social Theory and Social Structure* (rev. ed.). Glencoe, Ill.: Free Press, 1957.
10. OPPENHEIMER, M. The student movement as a response to alienation. *J. Hum. Relat.*, 1968, **16**, 1-16.

11. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, 80(1), Whole No. 609.
12. SEEMAN, J. On supervising student research. *Amer. Psychol.*, 1973, 28, 900-906.

Institute for Human Development

Fairfield University

Fairfield, Connecticut 06430

REACTIONS OF PREADOLESCENT GIRLS TO SCIENCE TASKS*

The University of Georgia

PATRICIA BRUCE

SUMMARY

In the spring of 1972, 90 students in the fourth through seventh grades of an Atlanta city elementary school participated in an experiment involving small group tasks that required creative scientific thinking. Each class was divided into groups of five each. The experiment was divided into three time periods: 25 minutes for exploring ideas and discovering uses, five minutes for planning and organizing, and 25 minutes for demonstrations. During all phases, the ideas and explanations advanced by each member, as well as interaction among members, were recorded by the group's trained observer. At the end, the subjects ranked themselves and the other group members on the basis of their contribution to the group's success.

The results show that there was only a significant difference between males and females on verbal creativity. On the variables of number of ideas and explanations initiated and advanced, self-ranking and rank by others, and enjoyment of the task there were no significant differences between the sexes.

A. INTRODUCTION

In recent years, numerous articles have been written and conferences held to examine the question: "Why are there so few women in the sciences?" In 1959 and 1960, Torrance (2) conducted experiments on the reactions of girls to science tasks and concluded that "in the early school years girls develop attitudes, interests, and even disabilities that make it difficult for them to become scientific discoverers and inventors" (p. 217). In the 1959 experiment many girls would not participate. Some said, "I'm a girl. I'm not supposed to know anything about science." Thus the boys were more productive in the tasks. The 1960 study, a replication of the 1959 experiment, showed improvement in the girls' performance so that they were equal to the boys; yet the value of their contributions was not rated as highly by their fellow group members.

* Received in the Editorial Office on December 7, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

Since 1960, civil rights legislation has facilitated women's pursuit of careers. There is evidence that women are taking advantage of the opportunity to break away from the traditional female role of being solely a housewife. The number of women working in 1970 was an increase of 36% over the number of women employed in 1960 (4). The number of women in the professional sciences,¹ traditionally a masculine career, almost doubled, jumping from 49,847 in 1960 to 95,536 in 1970 (4). From these statistics and other observations, the author hypothesizes that there is an increased breakdown in differences in male and female roles as a result of the increasing numbers of women working and having careers in areas previously monopolized by men. Furthermore, this loosening of formerly rigid roles affects the various social institutions that make up our broad culture.

The author also hypothesizes that the breakdown in the rigidity of roles will be reflected in school-age children. Although sex-role identification begins in the preschool years, it is not until the child reaches school age that he has reached a stage of cognitive development wherein a thorough differentiation of behavior and attitudes by sex is possible. At this time the child is also exposed to more social institutions so that he now has more nonparental adults to serve as models (1). Thus changes that affect our social institutions will in turn influence our children.

The purpose of the present study was to observe differences between pre-adolescent boys and girls in a group situation involving creative science tasks. It was hypothesized that there would be no significant differences between the two sexes on either of two productivity scales or on the peer ratings.

B. METHOD

1. Subjects

The subjects of the study were fourth, fifth, sixth, and seventh graders enrolled in an elementary school in the Atlanta City Schools. The socioeconomic background of the children was upper lower to middle class. There were 24 fourth graders, 19 fifth graders, 15 sixth graders, and 32 seventh graders.

Groups were formed by ranking all the pupils in each class on the basis of their scores on the *Torrance Tests of Creative Thinking* (3) administered

¹ The professional science careers, as opposed to technicians, were designated by the author to be architects, engineers, natural and physical scientists, physicians, dentists, and other related professional medical practitioners.

earlier in the school year as a part of another project. In each group there was one of the five most creative, one of the next five, and so on. The purpose of this scheme was to ensure heterogenous groups with the same distribution and range of creative talent. No group had fewer than four members, and the boy:girl ratio in all groups was either 2:3, 3:2, or 2:2 with the exception of two fourth grade groups which had a ratio of 1:3.

2. *Experimental Procedures*

In each class all groups were tested simultaneously. There were two groups to a room, but each of the groups within a room was protected from the influence of the other by dividers.

Before the classes were divided into groups, the experimenter told the entire class that the project was an activity to see how well they could work together in groups. He then explained procedures. He stressed that they were to work as a group. He further encouraged teamwork by offering a prize for the group that produced the most ideas. The experimenter also stressed that they were to think of unusual or unintended uses as well as the common uses of the objects. He then assured their understanding of this instruction by having them think of common and unusual uses for a pencil. Each was then given a colored armband to simplify the recording of the observations.

Each group was provided a set of toys including a whistle, rubber ball, magnet, pencil sharpener with a globe, a toy T.V. set, busy bee, magnifying glass, top, pencil, paper, string telephone, binoculars, gears, play dough, design blocks, plastic color-mixing plaques, and centrifugal force puzzle.

Each group was given 25 minutes for an exploratory period in which to experiment and discover uses and explanations for the toys. Then five minutes were allotted for organizing and planning the demonstrations. This was followed by another 25-minute period for demonstrating ideas and making explanations for the group's experimenter. After the demonstrations, each child was asked to rank each member of his group, including himself, according to the value of his contribution to the group's success. The children were also asked how much they enjoyed the activity.

For each group there was a trained observer who used a precategorized record sheet to tabulate the number of ideas initiated and explained during the exploratory period and to record all ideas demonstrated and explained during the demonstration phase. At the conclusion of each experiment the observers recorded a description of how the group organized the task, the roles the girls played in this organization, special groupings of the members,

how ideas initiated by the girls were responded to, the roles the girls played in planning the demonstration, and other observations of the interaction of the group during all phases.

3. Analysis of Data

For each individual, an average ranking was tabulated on the basis of the rank of contribution of peers made by each member in the group. On this rank, the lowest average would mean that the child was most valued by his teammates, and the highest average would indicate he was least valued.

Enjoyment of Task rating is on a scale of 1 to 5; 1 indicates maximum enjoyment of the task, and 5 means that the individual disliked the task.

An Exploratory Activity Level score was obtained for each individual by adding all ideas and explanations advanced during the exploratory period. With a similar basis for computation, a score for the Demonstration Activity Level was given. Finally each child was ranked in relation to his group on both the Exploratory Activity Level and the Demonstration Activity Level, and on his position in the group on the basis of peer ratings of contribution.

C. RESULTS

The analysis of variance data to determine the significance of the sex differences are presented in Table 1. There was a significant difference on Verbal Creativity scores between the two sexes, in the girls' favor, but on all variables of the experiment itself the differences were clearly not signifi-

TABLE 1
F VALUES AND SIGNIFICANCE LEVELS FOR SEX DIFFERENCES ACROSS CREATIVITY,
SELF AND PEER RANKINGS, ENJOYMENT OF TASK, AND ACTIVITY LEVELS

Measures	Boys (N = 40)		Girls (N = 50)		F
	\bar{X}	SD	\bar{X}	SD	
Total Creativity	346.87	45.35	364.04	57.31	2.38
Verbal Creativity	126.17	24.26	142.02	28.09	7.96*
Figural Creativity	221.87	30.82	222.60	37.25	.00
Average rank by others	3.08	1.25	2.81	.98	1.37
Self-ranking	2.60	1.52	2.76	1.11	.32
Enjoyment of Task	1.57	.77	1.50	.83	.28
Exploratory Activity Level	35.55	20.88	33.70	16.90	.21
Demonstration Activity Level	9.75	6.35	10.56	7.26	.30
Rank in group on Exploratory Activity Level	2.70	1.37	2.88	1.33	.39
Rank in group on Demonstration Activity Level	2.55	1.23	2.62	1.67	.06
Rank in group by peer ratings	2.90	1.44	2.46	1.12	2.64

* $p < .01$.

cant. Girls contributed as many ideas during the exploration and demonstration as did the boys, and they were given equal credit by their peers as well as themselves. They also enjoyed the tasks as much as the boys did.

D. DISCUSSION

Although the present study is not a replication of Torrance's 1959 and 1960 experiments, many of the test conditions were repeated. In both studies the subjects were in the upper grades of elementary school. Torrance also separated his subjects into groups of five, gave instructions emphasizing teamwork, then started each experiment with a 25-minute exploratory period followed by five minutes for planning, and concluded with another 25-minute period for demonstrations. In the earlier studies, each child was also asked to rank each member of his group, including himself, according to the value of his contribution to the group's success. Most of the science toys used in this study were the same toys used in Torrance's study.

The results of Torrance's 1959 study showed that boys exceeded the girls on ideas demonstrated. The mean for the boys was 6.18 contrasted with the girls' mean of 3.06. By means of analysis of variance, this difference was found to be significant ($p = .01$). In 1960, the means for boys and girls were almost identical, with 4.47 ideas demonstrated for boys and 4.34 for girls.

In order to determine if the girls' contributions to the group were valued the same as the boys, Torrance established composite ranks by adding the individual rankings and then ranking the totals. In both years the contributions of boys were more highly valued than those of girls. No significant changes occurred in the rankings between 1959 and 1960.

Torrance's results sharply contrast with the results of the present study. Using analysis of variance, the author found no significant differences by sex on the number of ideas and explanations initiated and demonstrated, self-ranking and rankings by others on contributions, or enjoyment of the task.

Conclusions cannot be drawn from a comparison of the results of the two studies because of the regional differences between Minneapolis, Minnesota, the location of Torrance's studies, and Atlanta, Georgia. However, it is interesting to note that the study that resulted in no significant differences by sex took place in the South, where, as most observers would agree, traditions have called for sharper sex-role differentiations than those of the upper Midwest. An examination of the occupations of the mothers in the Atlanta school indicated that almost none of them were employed in science

or science related positions, while a considerable number of the mothers in the Minneapolis school were employed in such positions.

In conclusion, the attitude that science is exclusively for males seems to be waning, as shown not only in the statistics but also in the lack of male dominance in the groups during the experiment itself. However, it was also shown that the group was much more objective in rating girls according to how much they produced. For the boys there seemed to be less demand for proof of abilities in the tasks.

REFERENCES

1. MUSSEN, P. H., CONGER, J. J., & KAGAN, J. *Child Development and Personality*. New York: Harper & Row, 1969.
2. TORRANCE, E. P. Changing reactions of preadolescent girls to tasks requiring creative scientific thinking. *J. Genet. Psychol.*, 1963, **102**, 217-223.
3. ———. *The Torrance Tests of Creative Thinking: Norms-Technical Manual* (res. ed.). Lexington, Mass: Personnel Press, 1966.
4. U. S. CENSUS OF POPULATION. *Subject Reports: Occupation by Industry*. Washington, D. C.: U. S. Govt. Print. Off., 1960, 1970.

442 *Atherton Hall*

Pennsylvania State University

State College, Pennsylvania 16801

A NOTE ON WEIGHT DISCREPANCY AND HUMOR* ¹

Ball State University

LAMBERT DECKERS AND PHILIP KIZER

SUMMARY

In a test of the discrepancy hypothesis of humor, Ss compared 11 comparison weights to a 90 gram standard. The 12th and 13th comparison weights were identical with, much lighter than, or heavier than the standard. More smile and laugh responses were made to the latter weights, and the number of these responses declined during the second presentation of those weights. The results supported the discrepancy hypothesis.

A. INTRODUCTION

According to discrepancy or incongruity hypotheses of humor, a discrepancy between two ideas or events produces humor (2). Nerhardt (3) examined the discrepancy hypothesis by employing weights in a psychophysical like task. He found that the incidence of smiling and laughing to a weight increased, the more discrepant it was from a series of weights *S* had been lifting. For weights, the discrepancy is probably between *S*'s neutral point or adaptation level (AL) and the discrepant weight.

In the present experiment, which tested predictions derived from the discrepancy hypothesis by the method of constant stimuli, Ss compared 11 comparison weights to a 90 gram standard. It was predicted that lifting the standard and comparison weights would produce an AL of 88.3 grams (1). The 12th and 13th comparison weights were both similar to, much lighter than, or heavier than AL. Laughing and smiling responses were expected to occur more frequently to the lighter and heavier comparison weights because they were discrepant from AL. The first discrepant weight should have shifted *S*'s AL toward it. Therefore, the second light or heavy weight was expected to produce fewer responses because these weights were no longer as discrepant from AL as previously.

* Received in the Editorial Office on December 12, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to thank Lawrence Oshier and Margaret Wickens for serving as judges.

B. METHOD

1. Subjects

Introductory psychology students volunteered for the experiment for course credit. There were 60 Ss, 20 in each group. Ss were assigned randomly within a given day to the different conditions.

2. Stimuli, Design, and Procedure

The 14 weights employed in the experiment consisted of a 90 gram standard weight and 11 comparison weights ranging from 80 to 100 grams in steps of 2 grams. Included also were 18 and 450 gram comparisons, which were the discrepant weights.

Each of three groups of Ss received either a 90, 18, or 450 gram weight as the 12th and 13th comparison weights. S's facial expressions to lifting these comparison weights constituted the dependent variable. Preliminary instructions stated the experiment consisted of lifting weights in order to study human decision making. Then S was asked for permission to be videotaped while lifting the weights. No Ss refused permission.

During the experiment, all Ss were presented the 90 gram standard and 11 comparison weights (including the standard) in the same random order by use of the method of constant stimuli. S's task was to judge whether the comparison weight was heavier or lighter than the standard. Each presentation of the standard and a comparison weight constituted one trial. The first 11 trials were used to establish S's AL. On trials 12 and 13 the control group compared the standard with itself, while Group 18 and Group 450 compared the standard with an 18 and 450 gram weight, respectively.

Ss lifted the weights by a string looped over a partition so that they could not see the weights. Eye contact between E and S was avoided by means of another partition, which E sat behind. The camera was turned on unobtrusively upon presentation of the standard on trial 11. Thus S's facial expressions on the last three trials were recorded. Videotapes of S's facial expressions were replayed on a 25 inch television screen. Two graduate students, who were unaware of the nature of the experiment or the writers' hypotheses, were used as raters. Their task was to categorize S's facial expression when lifting the comparison weights on trials 11, 12, and 13 into one of the three categories: no humor response, smile, or laugh.

C. RESULTS

The agreement between the two judges was 97.2%. Out of 10 disagreements, five were between the categories no humor and smile, and the others

between categories smile and laugh. The disagreements were resolved by discussion between the judges.

The number of Ss showing no humor response, a smile, or a laugh to the comparison weight on trials 11, 12, and 13 is given in Table 1. On trial 11 all Ss received the same comparison weight and thus did not differ in their responses, $\chi^2(4) = .44$; $p > .05$. Since no discrepant weights were presented, Ss showed few expressions of humor. On trial 12, the discrepant weights presented to Groups 18 and 450 produced significantly more smile and laugh responses in those groups than in the control group, which received the standard weight, $\chi^2(4) = 24.29$; $p < .01$. On trial 13, the two experimental groups again showed more smile and laugh responses than the control group, $\chi^2(4) = 15.28$; $p < .01$. Chi square assumptions were violated by the low expected frequencies in the laugh category on trials 11 and 13. Since the experiment was concerned with humor, the smile and laugh categories were combined into a single category. Chi squares with 2 degrees of freedom computed on these condensed contingency tables resulted in values of .44, 23.76, and 13.46 for trials 11, 12, and 13, respectively. These values resulted in the same statistical decisions.

Table 1 also shows a decline in the expression of humor from trial 12 to 13. Significantly more humor responses on trial 12 changed to no humor responses on trial 13 than the reverse according to a chi square test for change, $\chi^2(1) = 9$; $p < .01$. Of eight laugh responses by experimental Ss on trial 12, four changed to smiles and one to a no humor response. Of the 16 smiles, eight changed to no humor responses. No response on trial 12 changed to a more humorous response on trial 13.

D. DISCUSSION

According to a discrepancy or incongruity hypothesis, smile and laugh responses are the result of the discrepancy between the weight *S* expects and the weight *S* lifts. *S* expected a weight near the standard and lifted one

TABLE 1
NUMBER OF Ss SHOWING NO HUMOR, SMILE, OR LAUGH RESPONSES
ON TRIALS 11, 12, AND 13

Response category	Comparison weights (grams)								
	Trial 11			Trial 12			Trial 13		
	18	90	450	18	90	450	18	90	450
No humor	18	19	18	13	18	3	16	19	9
Smile	2	1	2	5	2	11	4	1	8
Laugh	0	0	0	2	0	6	0	0	3

equal to that or one much lighter or heavier. The results showed a greater frequency of smile and laugh responses for Ss who lifted the discrepant weight. These findings supported the discrepancy hypothesis and replicated the results of Nerhardt (3). After lifting the first discrepant weight, however, S's AL or expectancy shifted. Thus, in the second presentation, these weights were no longer as discrepant from S's expectation. Hence, there was a decline in the number of smile and laugh responses from trial 12 to trial 13.

Suls (4), however, in presenting a cognitive model of humor states that discrepancy is only the first stage in a two part process. The second stage consists of S's solution of the discrepant situation. Discrepancy then is a necessary but not sufficient condition for humor. Since Ss found the light and heavy weights funny, it is inferred that they were able to resolve the discrepancy.

REFERENCES

1. CORSO, J. F. *The Experimental Psychology of Sensory Behavior*. New York: Holt, Rinehart & Winston, 1967.
2. KEITH-SPIEGEL, P. Early conceptions of humor: Varieties and issues. In J. H. Goldstein & P. E. McGhee (Eds.), *The Psychology of Humor*. New York: Academic Press, 1972.
3. NERHARDT, G. Humor and inclinations to laugh: Emotional reactions to stimuli of different divergence from a range of expectancy. *Scand. J. Psychol.*, 1970, **11**, 185-195.
4. SULS, J. M. A two-stage model for the appreciation of jokes and cartoons: An information-processing analysis. In J. H. Goldstein & P. E. McGhee (Eds.), *The Psychology of Humor*. New York: Academic Press, 1972.

Department of General and Experimental Psychology
Ball State University
Muncie, Indiana 47306

THE ANALYSIS AND RESOLUTION OF INTERNATIONAL DISPUTES*

Yale University

LEONARD W. DOOB

SUMMARY

The principal aim of this paper is to summarize the best ideas emerging during an informal workshop in which sophisticated scholars and practitioners participated in an effort to identify and appraise possible new approaches to analyzing and resolving international disputes. The results are outlined in terms of the analyses and descriptions of such disputes; the measures that might be taken before, during, and after the disputes have arisen; and some of the methodological problems that arise. These diverse, heterogeneous materials can be tentatively synthesized, it is argued, by postulating the ideal attributes of a *Homo Pacificus*.

A. INTRODUCTION¹

From the evening of July 5 until the morning of July 11, 1973, there assembled in the Rockefeller Foundation's Villa Serbelloni (Bellagio, Italy) 22 men of good will and experienced dexterity who conversed with one another in an effort to delineate, according to the workshop's title which brought them together, "new developments and ideas in resolving international disputes." None of them at the time held official positions in government, although in the past a number had represented their countries as ambassadors or negotiators. Some were attached in various ways to the United Nations or to international or national private organizations interested in promoting peace through unofficial intervention, education, or research. Others were

* Received in the Editorial Office on December 26, 1973, and given early publication by editorial policy. Copyright by The Journal Press.

¹ The workshop was organized by the Academy for Educational Development, Inc. whose officers—Alvin C. Eurich, Edward W. Barrett, and Joseph E. Johnson—actively participated in all the sessions. Additional financial support was generously supplied by the Charles F. Kettering Foundation whose Director of International Affairs, Phillips Ruopp, was also a participant. The Rockefeller Foundation placed its magnificent Villa Serbelloni at our disposal, and the participants are indebted to the quiet hospitality offered by Dr. and Mrs. William C. Olson and their staff. The writer is grateful to Messrs. Barrett and Ruopp, as well as to William J. Foltz, for their constructive suggestions. Dale Christensen, Jr., of the Academy helped everyone during the stay at the Villa.

university professors. They came from 11 different nations, predominantly but not exclusively in the West. Their professional training, aside from diplomacy, had been in the social sciences, law, journalism, and psychology.

The group met every morning, every afternoon (except for Sunday), and on some evenings. With few exceptions to be noted, each session was devoted to various topics that had been formulated and announced in advance by two of the workshop's organizers who functioned alternately as chairmen. Discussants were required—in theory at least—to speak for no more than five minutes. In a half dozen instances semiformal presentations of particular subjects were permitted to last about a half hour. Fairly frequently there were quick give-and-take discussions between two or more participants, but equally frequently the person recognized by the chair ignored the previous speaker's remarks and expressed whatever was gliding through his own mind—and the earlier remarks in many instances were subsequently forever ignored. Nobody ever criticized the organization for which he was at the moment working. As often happens when highly educated, prominent persons interact, considerable ego-massaging for generous or selfish motives and an equal amount of ego-preening, either blatant or sly, were in evidence; the air was often thick with suspiciously sincere compliments.

In addition, the semiparliamentary mode was cast aside during two exercises: (a) a simulation problem involving a hypothetical conflict between India and China in which the total group was divided into one subgroup of "scholars" and another of "practitioners"; (b) the formulation of potentially fruitful approaches to various phases of negotiation by four small committees. All sessions, except for the activities in the subgroups, were tape-recorded;² this writer had been appointed rapporteur by the organizers of the workshop. No formal papers were read, but a half dozen were distributed in advance, only three of which were discussed in detail during the sessions.

This article aims not to summarize the proceedings, for they are lengthy, and perforce many of the ideas and proposals are not new. Instead it will indicate the most salient, exciting, promising themes that emerged and that merit further consideration. In the conventional language of psychology and social science, we have here data gathered not by formally surveying a representative sample of common men but by recording what a haphazard sample of sophisticated elite could produce under the indicated circum-

² Portions of the transcript will appear in a book being prepared under the auspices of the Academy for Educational Development and the Charles F. Kettering Foundation.

stances. No effort need be made, consequently, to relate what was said at the Villa to the voluminous literature on international relations; these men presumably were expressing what that literature and their own professions had taught them. In the Discussion a second goal has been sought: to reduce the themes of the workshop to common denominators both amenable to research and applicable to international negotiation and conflict reduction.

B. METHOD

What should one do with 956 pages of transcript? Clearly a formal content analysis which could establish statistical trends in the record would be utterly useless, since the emphasis is upon synthesis and new ideas. No, here is one person's impression of what took place in Bellagio on the basis of having been a participant observer during the workshop, of reading the records most carefully, of the criticisms of this paper he has received from colleagues in the enterprise, and of an imperfect knowledge of the relevant literature in the fields of international relations and conflict resolution. Two additional justifications for using such an informal, subjective method may be offered. In other areas of social science the label of clinical experience might be invoked; and the writer has had some experience in intervening (4, 5). Then in an imperfect, war-torn, war-threatened world promising ideas and proposals dare not be cast aside for puristic reasons.

C. RESULTS

Below and frequently on the surface three interrelated types of questions arose again and again at the Villa, and they were almost always related to social change: (a) *Descriptive-analytical*—What courses have past disputes followed and why? Why have some (perhaps few) negotiations been successful and others unsuccessful? (b) *Normative-prescriptive*—How can present or future disputes be prevented, mitigated, or resolved? (c) *Methodological*—What kinds of information are needed to improve descriptive-analytical and normative-prescriptive skills? Certainly no definitive answers can be given to these questions; if any existed, nations would not be plunging themselves into conflicts and war. And, the participants demonstrated, there are no sharp lines between the topics.

1. *Descriptive-Analytical*

At the beginning of any description or analysis is the fact of national differences, which in turn give rise to different national characters, different views of other nations, different principles and foreign policies, and hence

inevitably disagreements and international disputes. International disagreements and disputes, however, need not develop into conflicts, armed or otherwise. Disputes and conflicts are difficult to conceptualize for a variety of reasons. First, the facts may not be available when they are buried in inaccessible files or human heads. The number of variables is large, almost infinitely large when consideration is given not to abstract ones but to more concrete ones ranging from the state of the weather to the age and experience of the negotiators. It is also difficult or impossible to weight the variables in absolute or relative terms; what, for example, was the contribution of a given diplomat's tact to a final or temporary settlement of a boundary dispute? The temptation is great, if not irresistible, to adopt the humanistic position so characteristic of most historians and to declare that generalizations of any significance cannot be attained, each dispute is unique, every solution or resolution is one of a kind.

The choice between uniqueness and generalization is of course ancient. One meets it everywhere, beginning in psychiatry and psychology (where it sometimes appears under the headings of idiographic and nomothetic) and ending in history (where the issue is usually avoided by dealing with past events in all their uniqueness while slyly or coyly implying that the past has a lesson for the present and future without stating specifically what that lesson is). The issue generates more passion than reason, for it is patently, banally obvious that each case is unique but also shares something with other cases.

Noteworthy is the fact that the analysis of two specific negotiations in the past led to more prolonged discussions than almost any other topic: the agreement reached in 1954 between Yugoslavia and Italy concerning Trieste, and the intervention of the United Nations in Cyprus in 1967. In part this was due to the interest aroused by the presence at the workshop of some of the officials who had actually participated in reaching the settlements and who therefore could furnish intimate, relevant details. Also it was refreshing to examine concrete cases, to note both the similarities and the dissimilarities in the two situations, although a clean-cut conclusion did not emerge. Nobody, however, walked out of a session when one clear voice proclaimed that "we have all got to make a minimum commitment to theory building."

Disputes between nations ordinarily have involved territory, treatment of nationals, economic aggrandizement, prestige, power, etc. Within each nation, moreover, internal factors more likely than not have impact upon these ex-

ternal factors. The real or experiential poverty of a have-not country influences its leaders and citizens and, therefore, its foreign policy. In retrospect it appears that many conflicts would not have arisen or that negotiations might have been successful if domestic political tensions could have been reduced. The United Nations operates under a Charter that prevents it from interfering with the internal affairs of a state; hence it is perhaps not surprising that it has been able to settle definitively only two major conflicts so far during its precarious existence: viz., that between Iran and the Soviet Union and that between Indonesia and the Netherlands over West New Guinea. Internal factors may affect the range of choices available to a government; thus the treaties entered into by American diplomats must be ratified by the Senate. This interaction between external and internal factors, however, does not follow a fixed pattern. At the moment the internal problems of countries in the Middle East must be settled before a lasting peace there can be established, perhaps, but a detente in the relation between the Soviet Union and the United States has been or is being achieved by more or less neglecting internal pressures.

Sometimes the men at the Villa pinpointed their queries around similar problems and wondered not about disputes or conflicts *per se* but about specific topics, such as the following:

(a) Have there been safe disputes which have not led to overt conflict?

Answer: Yes; indeed sometimes "tensions" are needed to motivate the parties in a dispute to try to settle their underlying disagreements.

(b) Have there been stages through which disputes and conflicts "inevitably" go? *Answer:* Maybe yes, but with exceptions. One of the scholars at the Villa has examined 14 post-World War II conflicts; 13 "general categories of significant factors emerged" from the analysis. He is convinced that he has isolated "many and perhaps most of the influential variables" (2, pp. 24-25), thus implying, however, some degree of divergence for a given conflict.

(c) In the midst of all the multivariant factors related to conflicts and disputes, can it not be said that successful outcomes often depend in part on good luck, and unsuccessful ones upon bad luck? *Answer:* Yes, at least according to the most vocal participants, although it is possible that ascribing success or failure to luck merely masks ignorance concerning one or more subtle factors and their interaction. So far as could be determined at the Villa, a very similar reply must be given to the question of timing an intervention or a negotiation.

(d) Under what conditions can pressure be applied on governments to

begin or complete negotiations? *Answer:* There must be conditions, but they are not yet discoverable; hence some meaningful and some meaningless assertions are made to the effect that the pressure should not be "clumsy."

A very fruitful, researchable question was raised concerning the sources of resistance to negotiation by governments. Off the top of one sagacious head came four suggestions. A nation's leaders may be convinced they can accomplish more through the use of force or by functioning unilaterally. Negotiating might entail heavy costs, such as delays or antagonizing a friendly power. Another loss can be symbolic: meeting the antagonist is equivalent to recognizing him or tarnishing one's own sovereignty. And unfavorable attitudes may exist toward a particular negotiating or mediating mechanism—and the name of the UN Security Council was whispered in this context. On the positive side it was suggested that resistance might be overcome through a three-pronged attack: (a) creating an international atmosphere in which negotiation must be "considered the answer" to disputes; (b) offering the parties to a conflict "a kind of inducement or carrot" in the form of anticipated advantages from negotiating; and (c) establishing "a network of constraints" which virtually force the parties to negotiate. How this attack can be launched and how it might be successful were not indicated.

Finally, there were illustrations of hoary, honorable principles of social science or commonsense. Big or little powers, for example, cooperate more eagerly in the presence than in the absence of a crisis that might affect their own welfare—a variant of the postulate that external threats promote internal cohesion. Or from any standpoint, especially a dialectical one, "conflict and tension or misunderstanding is part of cooperation . . . which you overcome in some form because of love."

2. *Normative-Prescriptive*

Modifications and innovations burst out of the participants at almost every session because they had assembled to do just that and also because each was eager to display his originality. They can be assorted into those generally necessary in the present day world and those useful prior to, during, or after a particular negotiation. Not surprisingly, since a number of those present were or had been associated with the United Nations, numerous suggestions involved the functioning of that body. The "good offices" of the Secretary-General, it was said, should be strengthened and extended. The Security Council must assume a more active role in encouraging or forcing nations to negotiate; its effectiveness might be increased if each of the world's regions could participate in its decision-making processes. Ideas such as these were

greeted by some as wishful thinking: the Charter cannot be easily amended. Other proposals were advanced, on the sensible assumption that all earthly problems cannot be settled on a world level. Bilateral and multilateral agreements should provide for periodic discussions of an informal nature between the parties concerned and also especially prior to negotiation whenever disagreements arise; thus better rapport among government officials might be established, or at a minimum vital information could be exchanged. More regional or subregional organizations would serve the same purpose. Since the big powers are preoccupied with their own struggles and the little powers with their internal problems and also since "the great powers have failed to set anything like a good example" to other nations, as one former diplomat quietly said, blocs of so-called middle powers should be formed to exert their influence directly or through the United Nations in behalf of peace. Behind most of these proposals was the deliberate aim of entangling each nation in such a thick web of agreements that negotiation would have to be substituted for force.

Equally conspicuous were references to private organizations which aim to reduce human suffering or international tensions and which, as one man remarked, sometimes even compete with one another to find and assist victims of oppression and tyranny. Here, if ever, there is the possibility of experimentation in the trial-and-error sense. These organizations are in a position to initiate actions not open to governments: They can provide forums for unofficial discussions, they can mobilize authoritative bodies other than governments, they can carry out independent analyses of problems of interest to decision-makers, or through the mass media they may "create a climate in which policymakers can usefully work." Perhaps a small organization—completely private and detached from the United Nations—might be established which, like arbitration and mediation associations dedicated to preventing or resolving labor-management disputes, would stand ready to offer third-party, nonofficial services on an international level. But, among many skeptical challenges, the one voiced loudest of all referred to the inability of such a group to enforce its decisions, as has been the case even with the World Court.

Discussions occasionally focused upon the mass media. The United Nations should utilize these media to an even greater degree in order to inform peoples everywhere not only concerning the desirability of the principle of negotiation but also concerning the unresolved international disputes. The media, either on their own initiative or as a result of encouragement from governments and private associations, might be able to

identify nascent disputes before they reach the conflict stage. To be sure, references were also made to textbooks preaching hate and promoting misunderstanding.

Moral pressure through all available means is needed to convince leaders and their followers that disputes and conflicts must be settled peacefully. In this context, but often also whenever human beings rather than abstractions were mentioned, the cry could be heard that mankind needs a credo to inspire agreement and enthusiasm and to be transmitted through the educational systems and the media. At the Villa no credo as such was formulated, but certain candidates for inclusion seem to have won informal approval: (a) The only *status quo* worth preserving is the *status quo* of non-violence. (b) A nation's most sacred obligation to other nations is to negotiate differences (*cf.* Article 33 of the UN Charter). (c) Do not expect all countries to be like yours. (d) Peaceful coexistence is possible. (e) Humanitarian principles transcend national boundaries. (f) In the affairs of men irreducible values are those involving human rights, equal rights, and self-determination. Perhaps the services of a poet ought to be enlisted to phrase these cries-in-the-darkness.

Two specific proposals involving action prior to negotiating a dispute or conflict were suggested. The first, developed at M.I.T. and known as CASCON (the acronym for "Computer-Aided System for Handling Information on Local Conflicts"), is based upon an analysis of 52 international conflicts since World War II by ambassadors, former mediators, desk officers, and scholars who coded the facts and their opinions by means of a schema based on 482 factors that were sorted into 11 categories. It is thus possible to learn tentatively the successful and unsuccessful solutions associated with past disputes which, according to the computer, resemble the new dispute in some or many respects (1). The technique is applicable to general questions such as: Have threats produced compliance during bilateral negotiations or as a result of the mediation of a third party? *Voir pour prévoir*, of course—but Comte's dictum may or may not be relevant when present or future disputes raise new issues of the present like pollution and the use of satellites.

Voir pour intervenir? The second proposal involves bringing together at some neutral site persons from the nations in conflict, whether official or unofficial, into a workshop lasting several or many days during which they either secure information from experts (3) or interact in a manner that enables them to communicate more efficiently, trust one another, or obtain insight into the ways in which organizations and they themselves as persons

function (4); in any case, out of such a confrontation it is hoped that creative or at least novel solutions will emerge.

On the basis of diplomatic experience in the past, of anthropological knowledge, and of laboratory studies of interacting groups, a cornucopia of unsorted ideas was considered to be relevant to the promotion of more efficient, fruitful negotiation. Ways of improving the recruiting, training, and retraining of negotiators and diplomats, as well as of official and unofficial third-party intervenors, although a problem not new to research and obviously of practical interest to many individuals and organizations, ought to be reassessed again and again. For example, can insights and the discipline obtained from psycho- and sociolinguistics or cultural anthropology aid the flow of communication at the conference table? Or would it be helpful in the long run to have not national but international institutes in which aspiring diplomats would learn the necessary skills?

Conceivably very general principles might be evolved concerning the types of persons who as negotiators can deal with particular kinds of conflicts of antagonists and not others. What kind of ability or training is needed for someone in the diplomatic service to be able to offer a policy recommendation or a researched opinion within 15 minutes in response to an urgent cable? Africans may want Africans to settle African differences, it was said; if so, then ethnicity or culture becomes a qualification for diplomacy. Instances galore were cited in which the success or failure of a negotiation depended upon the skills, the reputation, even the personality of one or more leaders. Rules of thumb concerning the qualifications of third-party mediators or arbitrators were delineated: under most circumstances such persons must be neutral and flexible; they must appreciate the subtleties of the cultures represented by the parties to the dispute; they must evoke respect (which means in Africa and Asia that they usually can exert authority only through seniority).

A host of shape-of-the-table, conference-management, protocol factors must play some role in affecting the ability of negotiators to reach peaceful solutions to disputes: the length and number of sessions per day or for the conference as a whole, the kind of relaxation between sessions (with time enough to have conversations, fruitful or otherwise, at the bar), the timing of the sessions (the day, the season), the location of the meeting's site, the amount of privacy afforded the negotiators, the ordering of items on the agenda, the optimal number of participants, the adequacy of translations, etc. The men at the Villa recognized the potential importance of these factors,

some of which at first flash may appear trivial, but were convinced also that they can only be listed without being amenable to invariable principles. The belief that non-Western societies have techniques for reaching consensus which might serve as a model in the West was expressed and immediately denied: can the Ganda way of conducting a meeting or the Somali method of rotating chairmen from speaker to speaker be adapted to modern international negotiations?

During actual negotiations, two subgoals should be achieved, or at least they are considered desirable. First, the negotiators must have confidence in one another or in the countries represented at the conference. Such confidence may result from actions in the past ranging from the payment of debts and the joint use of satellites to the travels of tourists and the international exchange of persons. It may also come into existence on a personal basis when the negotiators are acquainted with one another. Knowledge of the basic preconceptions of the other side and of its values subject or not subject to change is essential. Secondly, resolutions or solutions usually require some modification in the initial demands of the disputants. Often this can occur when the issue or issues are redefined: they may be reformulated, fractionated, or transcended; some may be postponed or left fuzzily undefined, others may be handled implicitly without an exchange of views. The moment a negotiation is thought of not as either a debating society or a zero-sum game, but as an opportunity to resolve problems at a basic level, there is room for maneuvering and creativity without necessarily succumbing to the perils inherent in improvisation. The issues verbalized at the outset of the negotiation may not turn out to be the real ones (the foreign office seeks not territory but prestige or self-respect, or *vice versa*), and the upshot can in fact be satisfactory to both sides.

Skepticism was expressed not concerning the use of summitry in some international situations but concerning the possibility of ever formulating systematic guides describing what can or should take place under these unusual circumstances. Here, if ever, the role of individuality looms largely. It was of course recognized that the leaders at the summit are usually hell-bent to produce some kind of settlement to decorate the final communique.

The voices at Bellagio were singularly sterile concerning what might be done to carry out or enforce international agreements when they have been achieved. "After a successful negotiation or a phase of the negotiation, we think there ought to be an examination to see what could be done to follow," the chairman of a subcommittee reported. He mentioned, however, only "an international presence" (a peace-keeping force or observers, even social

scientists) and the exchange of news by the mass media within the countries reaching agreement. Some of the measures proposed for the prenegotiation stage, moreover, are relevant here.

3. *Methodological*

It was to be anticipated that the participation of active scholars and of retired and active diplomats would result in a host of ideas concerning the need for data relevant to international disputes and conflicts. Nothing sensational emerged, even when the participants were divided into subgroups of scholars and practitioners and then tried to imagine, respectively, what information they would seek and what they would do in connection with a hypothetical conflict between India and China. On a theoretical plane the old issue of the uniqueness of each dispute *versus* its relation to other disputes was again tossed about, with those of humanistic bent maintaining that generalizations are impossible, too abstract, or useless, and those from the social sciences upholding the reverse position. Nobody objected strenuously to the potential utility of CASCON perhaps because they were somewhat cowed by the computer. In the Sino-Indian simulation game some of the scholars were fearful that they would appear too foolishly theoretical in front of the practitioners who in turn showed more concern for research and "intelligence" than they ordinarily do, inasmuch as they were aware of the scholars in another room.

In addition to saying that we need more information and better or no generalizations, the participants at the workshop explored the gap separating scholars and practitioners. It was demonstrated and agreed that this gap remains wide because each group has different values or objectives. The scholars try to be careful and complete, the practitioners active and decisive; the scholars would know too much or else they simply raise impertinently relevant questions, the practitioners want quick, compelling solutions. Both groups, moreover, seek the personal glory and immortality they modestly deny that they seek, the scholars through words, the practitioners through deeds. The challenge is to find ways to narrow the gap between the two, and this ought to be, but is not, an easy objective to attain whenever scholars wish to have their output useful internationally and whenever leaders and negotiators would improve their knowledge in order to be more certain of success. Some guidelines became visible:

(a) Scholarly analyses must be offered in a form that can be grasped and utilized by negotiators; otherwise they will not be read. The latter are busy people, or imagine themselves to be busy, and they already have information

at their disposal from their own sources; in some instances, consequently, they may be unaware of what they do not know and hence be less than eager to move through the jargon and quantification of the academies.

(b) Conceivably either within existing institutions or governments or in a new institution (which of course was immediately opposed by some of those already in business) a new breed of scholars needs to be developed who can produce knowledge that is immediately or ultimately useful. There is perhaps an approach yet to be discovered that lies between the basic research of the scholar and the fleeting report of the intelligence officer, the journalist, and the pollster. It is important, perhaps, to be reminded that the needs of practitioners can often exceed the reach of the scholar; even with ample funds, some types of research are simply not feasible.

(c) While it is clearly true that the analysis of a conflict is not equivalent to finding its resolution, some analysis is probably never utterly useless and is likely to be a first if microscopic step in the direction of resolution. Closer liaison between the realm of scholarship and the world of negotiation, therefore, is necessary and desirable. Scholars perhaps should be less shy in trying to gain attention, leaders and negotiators less confident concerning their own omniscience. Periodic meetings between scholars and medium-echelon officials of government may alert the former concerning the areas requiring research and the latter concerning potential or actual disputes before the crisis stage is reached. The challenge to the scholar is how to gain the attention of decision-makers without sacrificing the cautiousness or credibility of his craft.

(d) Scholars, when they lack data or when pressing decisions must be made quickly, can at a minimum raise trenchant questions springing from their disciplines and germane to the problem at hand. This contribution can be made in spite of the fact, as one scholar with practical experience in diplomacy admitted, that "those of us who are in the social sciences full time agree there is no general theory" to deal with all the social phenomena involved in disputes and conflicts.

D. DISCUSSION

The scholarly ideas reported in the previous section cannot be decisively evaluated. Clearly no one of them, no combination by itself can shake the cosmos or engender an instant understanding of international disputes or conflict resolution. Social inventions, like all inventions, spring from mixtures of the old, and clearly men almost everywhere are groping. The men at the Villa seldom agreed on whether to accept or disparage an idea; for example, laboratory or experimental studies of groups in conflict were modestly ac-

claimed by some of the scholars as providing tentative insight into relevant parameters, yet they seemed to this observer to be respectfully ignored or not understood by the practitioners. *But* all the participants agreed on one banal, compelling value: war is bad, peace is good.

To this observer there seems to be a way not to produce an immediate scholarly miracle or the millenium but to begin to reduce the theoretical problems to a common denominator and to catch a glimpse of one pathway to peace. That approach is an ancient one: forget broad terms, forget organizations for the moment, and concentrate upon specifiable human beings. "National interest," for example, is a concept that is glibly and usefully bandied about, but perhaps can become more meaningful when the persons in the country, whose goals or welfare is supposedly involved, have or can be identified. The detached observer of peace—obviously he comes not from Mars but from Venus—would first delineate the cast of characters within a country potentially or actually participating in an international dispute, and he would see four groups interacting with one another: leaders, followers, negotiators or diplomats, and communicators. The last named group must be included, since those concerned with education, the mass media, or the transmission of information with an organization or institution obviously affect disputes. The Venusian, after noting these not sharply separated groups, would quickly learn a sad fact: the earth is plagued with conflicts, some of which produce destruction and death. It might not take him longer to discover that the conflicts are not conflicts between vague entities called nations but between and among men belonging to the groupings. Destructive conflicts are conflicts of individuals who wittingly or unwittingly would destroy one another. Eventually the Venusian would try to approach the root of the problem.

And what is the root of the problem? On the level of scholarship the parameters must be established by identifying the psychological concepts or variables which can subsume the behavior of men in conflict. With considerable hesitation this writer suggests that at a minimum four are essential: (a) goals, (b) knowledge, (c) attitudes, and (d) skill. Of course the four must be weighted most diversely from situation to situation, but they strive to reflect the common core. When it is said, for example, that international negotiations usually are facilitated by secrecy and then an instance is cited in which non-secrecy has produced a bouncing success, the common skill component of both is perhaps that of the flexibility of the negotiator, in the first instance attained through secrecy, in the second through publicity. Case histories or even isolated anecdotes thus conceivably might suggest how one or more of the four variables may function. The proposal that "the Security Council

should have more power" must be translated into operational terms: locate the persons whose goals and attitudes must be altered; delineate power in a manner that refers to the relations between the representatives of nations; and outline the effects upon leaders and followers of the proposed change.

Then the Venusian can turn directly to the ethical problem of attaining peace—or at least less war. He would note that the men in conflict are imperfect, yet they possess the attribute of perfectability. How does one know that this is so even before seeking vainly to define perfectability? There have been, there are good men to point to, men of art, religion, science, even politics and commerce, who have transcended destructive conflicts and hence might offer hopeful, helpful guides. And so the visitor from Venus conceivably could suggest the attributes of Homo Pacificus by utilizing the same four scholarly variables. He would postulate weights for leaders and diplomats, with minor or major variations for followers and communicators:

1. *Goals.* Maximum attainment of goals involving a minimum interference with the goals of others.
2. *Knowledge.* Valid, relevant information concerning all major aspects of conflicts or disputes, and ways of avoiding them.
3. *Attitudes.* Favorable or at least tolerant attitudes toward actual or potential antagonists; rejection of the use of force and of war; favorable attitudes toward negotiation and other peaceful ways of settling disputes.
4. *Skill.* Ability to interact constructively with other persons.

In short, the ideal of a Homo Pacificus might unify the goals of scholarship and deliberate social change and therefore speed the demise of Homo Maleficus.

REFERENCES

1. BLOOMFIELD, L. P., & BEATTIE, R. Computers and policy-making: The CASCON experiment *J. Conflict Resolut.*, 1971, **15**, 33-46.
2. BLOOMFIELD, L. P., & LEISS, A. C. Controlling Small Wars. New York: Knopf, 1969.
3. BURTON, J. W. Conflict and Communication. New York: Free Press, 1969.
4. DOOB, L. W., Ed. Resolving Conflict in Africa: The Fermeda Workshop. New Haven, Conn.: Yale Univ. Press, 1970.
5. DOOB, L. W., & FOLTZ, W. J. The Belfast Workshop. *J. Conflict Resolut.*, 1973, **17**, 489-512.

Department of Psychology
Yale University
333 Cedar Street
New Haven, Connecticut 06510

RESPONSE SET ANALYSIS OF MOTHER'S FORM OF PARENTAL ATTITUDE RESEARCH INSTRUMENT (PARI)*

Department of Psychology, University of Manitoba

SHIRIN SCHLUDERMANN AND EDUARD SCHLUDERMANN

SUMMARY

Female college students ($N = 293$) completed an unreversed (Q1) and a reversed (Q2) form of the Mother's Parental Attitude Research Instrument (PARI). By comparison of answers on the two forms, three response sets were calculated: acquiescence, opposition, and extreme sets. The acquiescence and opposition sets showed substantial correlation with Q1 scales, and the extreme set correlated substantially with Q2 scales. Factor analysis corroborated scale analyses. The investigators suggested a method of developing a new Mother's PARI (Q4) which would minimize acquiescence and opposition sets by selecting appropriate Q1 and Q2 scales.

A. INTRODUCTION

Mother's form (IV) of the Parental Attitude Research Instrument (PARI) as developed by Schaefer and Bell (4) was constructed as an attitude assessment inventory. Subsequent studies on PARI as a research instrument revealed a number of drawbacks. The most serious drawbacks were those of response set bias effects. Zuckerman (7) developed a set of 20 reversed scales to control for the acquiescence response sets in PARI. Becker and Krug (1) in their review of the PARI discussed the problems presented by the influence of response set biases on the PARI. It was observed by Becker and Krug (1), as well as by Zuckerman and Norton (8) and Zuckerman, Norton, and Sprague (9), that Schaefer and Bell's (4) questionnaire IV (Q1) was phrased in such a way as to elicit a high level of acquiescence in the respondent. Aware of these problems, Bell and Schaefer (3) and Bell (2) suggested the method of partialling out the effects of acquiescence (total number of "agree" responses) in order to control for this bias. This could be done with group data or with individual cases. Becker and Krug (1) pointed out that partialling out of acquiescence effects might likely result in overcorrection for

* Received in the Editorial Office on December 14, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

response set variance. They also expressed doubts that Zuckerman's approach of using reversed scales would do the job because they argued that acquiescence measures based on reversed items would still likely be weighted toward authoritarian or strict control. Becker and Krug tried to evaluate the relationship between strictness and acquiescence by balancing "yes" and "no" responses in measuring strictness, and freeing the acquiescence measure from the strictness content. They reported that when a balanced scale was used, there still remained a small but consistently significant relationship between acquiescence and strictness. They recommended, therefore, a forced choice between pairs of items as a more promising approach to the problem of response set biases.

A response set may be defined as the *S*'s tendency to respond consistently to test items in terms of variables other than content. Such responses may be due either to *S*'s tendency to "agree" consistently (acquiescence set) or to "disagree" (opposition set) or to give "extreme" answers (extreme set). Items may be phrased in such a way that the *S* may feel a strong need to "agree" or "disagree" with the statements. Schludermann and Schludermann (6) investigated the response set biases of the Father's form of the PARI and suggested ways whereby the response set biases of that instrument could be minimized. In view of the fact that the Mother's form of the PARI similarly presented problems of response set biases to the users of the PARI, the present study was undertaken to find ways and means to minimize such biasing effects of the instrument. Therefore, an attempt was made in this study to determine to what extent acquiescence set, opposition set, and extreme set influenced the scale score of Q1 (Schaefer and Bell's PARI form IV) and Q2 (Zuckerman's reversed scales of PARI) and also to what extent they influenced the factors of the PARI scales in an overall factor analysis of Q1 and Q2 scales.

B. METHOD

1. Subjects

Previous study (5) demonstrated that the factorial validity of PARI scales in reversed form was maintained. A comparison of Q1 and Q2 factor structures with that of Zuckerman *et al.* (10), as well as with that of Schaefer and Bell's analyses, showed that the factors remained stable and replicable across samples. The study also supported Schaefer's statement that less experienced women would reveal a more complex factor structure than experienced mothers. Since the study was designed to investigate effects of

response set biases on the PARI, differences between more or less experienced women in child-rearing would have little bearing on the methodological concerns of the present research. Two hundred and ninety-three female college students between the ages of 17 years to 22 years (mean age 18.5 years) participated in the study. The Ss were enrolled in various college faculties and departments at the University of Manitoba, and lived mostly in urban areas (e. g., Winnipeg).

2. *The Instrument and Procedure*

PARI (Q1)¹ consists of 23 scales of five items each. The S is asked to check one of the four alternatives to each item. The alternatives are Strongly Agree (A), Agree (a), Disagree (d), and Strongly Disagree (D). The alternatives are scored as 4, 3, 2, and 1 in the unreversed scales of Q1. The second form of PARI, Q2¹, was used as developed by Zuckerman by reversing the items of Q1. The Q2 contains 20 scales corresponding to 20 scales of Q1. The four alternatives on Q2 were scored as 1, 2, 3, and 4, respectively, for Strongly Agree (A), Agree (a), Disagree (d), and Strongly Disagree (D). The reversed scoring in the two questionnaires was based on the fact that the items in Q2 were reversed in such a way that if an S were logically consistent, agreement with a given item on Q1 implied disagreement with the corresponding item in Q2. Therefore, a perfectly consistent S should obtain the same scores on Q1 and Q2. All Ss responded to Q1 and a week later answered Q2. Schaefer's standard instructions were used.

C. RESULTS

1. *Comparison of Q1 and Q2 Scales*

Table 1 shows the means and standard deviations of Q1 and Q2 scales. Four scales showed strong agreements (means 15 to 20), and six scales showed strong disagreement (means 5 to 10) on Q1. While six scales showed strong agreement (means 5 to 10) on Q2, none of the Q2 scales showed strong disagreement (means 15 to 20).

If a difference of less than 1.0 between the corresponding Q1 and Q2 means is interpreted to indicate that the means are equal, then nine scales met this criterion. On the other hand, if the difference was more than 2.0 between the corresponding means of Q1 and Q2, the means were regarded as unequal; only three scales met this criterion.

¹ For copies of Q1 and Q2, write directly to the authors at the address shown at the end of this article or order NAPS Document No. 02305 from Microfiche Publications, 305 East 46th Street, New York, New York 10017; remit \$1.50 for microfiche or \$5.00 for photocopies.

TABLE 1
MOTHER'S PARI: RESPONSE SET BIAS

Scales ^b	Means		SDs		Correlation coefficients ^a				Extreme response set vs.	
	Q1		Q2		Acquiescence set vs.		Opposition set vs.		Q1	
	Q1	Q2	Q1	Q2	Q1 vs. Q2	Q1	Q2	Q1	Q2	Q2
1	17.5	—	1.8	—	—	01	—	-13	38	—
2	8.6	10.1	2.4	1.9	25	39	-10	-23	-28	-31
3	10.2	8.4	2.6	1.8	26	52	-09	-22	-27	-51
4	10.3	9.8	2.6	2.1	20	56	-11	-33	-25	-37
5	11.2	10.3	2.8	1.8	29	54	-00	-36	-23	-28
6	13.8	11.9	2.7	1.8	27	45	-07	-39	03	-11
7	16.0	13.7	2.2	2.4	34	23	-27	-23	11	—
8	11.5	13.7	2.7	2.5	44	29	-06	-23	18	—
9	13.8	12.7	2.7	2.1	36	32	-13	-32	-22	-09
10	9.5	9.6	2.3	2.1	36	47	00	-25	15	03
11	11.4	11.3	3.0	2.1	34	55	-03	-31	-31	-37
12	11.1	11.7	2.3	2.0	31	45	-14	-24	-26	-20
13	12.6	11.0	2.7	2.0	32	38	-25	-30	-20	-11
14	16.1	—	2.1	—	—	03	—	-12	01	-12
15	13.4	11.5	2.7	2.0	26	42	-06	-36	30	—
16	9.7	8.2	2.6	2.2	26	41	-17	-20	01	-10
17	11.5	11.4	3.0	2.0	29	49	-14	-34	-28	-47
18	8.0	9.6	1.9	2.2	48	39	03	-21	-11	-13
19	9.8	12.4	2.7	2.6	03	48	-23	-36	-18	-41
20	8.7	9.5	2.8	2.5	48	41	08	-21	-27	06
21	17.0	—	2.0	—	—	-13	—	-18	-26	-40
22	12.2	12.3	2.8	2.2	41	00	-04	-30	25	—
23	12.5	13.4	2.8	2.2	33	-03	-15	-34	-04	-05
									-07	01

^a For all correlation coefficients decimal points have been omitted (e. g., .25 is .25).^b Scales: 1. Encouraging Verbalization, 2. Fostering Dependency, 3. Seclusion of the Mother, 4. Breaking the Will, 5. Martyrdom, 6. Fear of Harming the Baby, 7. Marital Conflict, 8. Strictness, 9. Irritability, 10. Excluding Outside Influences, 11. Deification, 12. Suppression of Aggression, 13. Rejection of the Home-making Role, 14. Equalitarianism, 15. Approval of Activity, 16. Avoidance of Communication, 17. Inconsiderateness of Husband, 18. Suppression of Sexuality, 19. Ascendancy of the Mother, 20. Intrusiveness, 21. Comradeship and Sharing, 22. Acceleration of Development, 23. Dependency of the Mother.

The correlation coefficients (Table 1) greater than $\pm .20$ were taken as significantly different from zero (one percent level, two-tailed test) for the sample size ($N = 293$) of this study. There were four scales where correlations between corresponding Q1 and Q2 scales were moderate (between .40 to .60), 15 scales where correlations were low (between .20 to .39), and only one scale where the correlations were not significantly different from zero (0 to .19).

2. Response Set Bias

Three response set scores were calculated for each S:

(a) *Acquiescence set* was defined as the tendency to agree with mutually contradictory items. The percentage of items where an S either "agreed" or "strongly agreed" with corresponding Q1 and Q2 items was taken as the measure for acquiescence set. The mean acquiescence set was 19.6 with a standard deviation of 8.3.

(b) *Opposition set* was defined as the tendency to disagree with mutually contradictory items. The percentage of items where an S either "disagreed" or "disagreed strongly" with corresponding Q1 and Q2 items was taken as the measure for opposition set. The mean opposition set was 17.9 with a standard deviation of 6.6.

(c) *Extreme (response) set* was defined as the tendency to check off the extreme ends of the choice points. The percentage of items where an S either "strongly agreed" or "strongly disagreed" was taken as a measure of extreme set. The mean extreme set was 33.2 with a standard deviation of 16.1.

The correlation coefficients between the three response sets were calculated. There was a high negative correlation ($-.66$) between the acquiescence set and the opposition set. The correlations between the extreme set and the other two response sets were close to zero ($-.05$ and $-.00$).

When the response set biases of the Father's PARI (6) were compared with those of the Mother's PARI, the response set biases of the latter instrument tended to be considerably higher (i. e., acquiescence set mean 19.6 vs. 11.1; opposition set mean 17.9 vs. 6.9; extreme set mean 33.2 vs. 16.1). Compared with the Father's PARI the Mother's PARI showed a much stronger opposition set and much higher negative correlation between the acquiescence set and opposition set (mean $-.66$ vs. $-.36$).

3. Response Set and Scale Scores

The three response set scores were then correlated with the scale scores of Q1 and Q2. For the sample size ($N = 293$), the correlation coefficients would

have to be higher than $\pm .20$ in order to be significantly different from zero. Correlations between response set scores and the scale scores that were below $\pm .20$ were interpreted as suggesting that the contribution of the response set to that scale was negligible. Correlations that were higher than $\pm .30$ might be regarded as evidence that the scale score was seriously biased by the response set.

According to these criteria, the acquiescence set seriously biased 16 scales of Q1 but none of the scales in Q2. Five scales in Q1 in comparison to 17 scales in Q2 showed an insignificant acquiescence set (less than $\pm .20$). The results thus suggested that the Q2 was much less influenced by the acquiescence set than Q1. The opposition set seriously biased 11 scales of Q1 and only two scales of Q2. Three scales of Q1 and 11 scales of Q2 showed insignificant opposition set effects (less than $\pm .20$). The results suggested that Q2 was also much less influenced by opposition set than Q1. Comparing Q1 and Q2 for the extreme response set showed the following results. Four scales of Q1 but seven scales of Q2 were seriously biased by the extreme response set. Eight scales of Q1 but 11 scales of Q2 indicated insignificant extreme set influence (less than $\pm .20$). Thus the Q2 appeared to be more highly influenced by the extreme response set than did the Q1. The results therefore indicated that item reversal had considerably reduced the effect of acquiescence set, and somewhat reduced the effect of opposition set, but had increased somewhat the effect of extreme response set on Q2.

4. Response Set and PARI Factors

The scales of Q1 (23 scales), of Q2 (20 scales), and the three response set measures were combined to generate a 46×46 correlation matrix. The correlation matrix was factor analyzed with use of the principal axes solution and an eigenvalue of 2.0 as a cutoff criterion. Four factors that emerged were rotated by the Varimax method and accounted for 39.01 percent of the total variance. The last factor (F_4), labelled Strictness factor, accounted for 4.4 percent of the total variance and loaded only on two scales: i. e., Strictness and Suppression of Aggression. F_4 did not correlate with any of the three response set measures.

The first three factors were highly similar to the findings of the previous studies. The first factor was labelled as Authoritarian and Psychological Control factor (F_1). The first factor had significant ($> \pm .40$) loadings only on Q1. Eighteen of Q1 scales had thus significant loadings on F_1 . The acquiescence set showed a high positive loading (.88), while the opposition

set showed a fairly high negative loading ($-.66$), and the extreme set loading was negligible ($-.21$).

F_2 was labelled as the Anti-Democratic Attitude factor and consisted of eight scales of Q2 and two scales of Q1 with significant loadings ($>\pm.40$). The acquiescence set showed negligible loading ($-.17$), the opposition set showed low significant loadings ($.44$), whereas the extreme set showed high negative loading ($-.70$) on F_2 .

F_3 was labelled as Marital Conflict factor, which consisted of six scales of Q2 and two scales of Q1 with significant loadings ($>\pm.40$). None of the three response sets had significant loadings on F_3 .

It is interesting to point out that out of 18 Q1 scales that described F_1 , 15 scales were seriously biased (correlation $\geq \pm.30$) by the acquiescence set, and 14 of these 18 Q1 scales were also seriously biased by the opposition set. The factor loadings of $.88$ for acquiescence set and $-.66$ for opposition set on F_1 tend to reconfirm the findings noted in the scale analyses. Similarly, five of the eight scales in Q2 and two scales in Q1 that described F_2 were seriously biased ($r \geq \pm.30$) by the extreme response set, and only somewhat by the opposition set. The factor loadings of $-.70$ for the extreme set and $.44$ for the opposition set confirm the results of the scale analyses. Lastly, none of the scales that composed F_3 was seriously biased by any of the response sets; this is corroborated insofar as none of the response sets showed significant loadings on F_3 .

D. DISCUSSION

The Mother's PARI items positively stated (Q1) were seriously biased by acquiescence and opposition sets. On the other hand, item reversal (Q2) tended to increase the extreme set bias.

The acquiescence and opposition sets maximally influenced the Authoritarian and Psychological Control factor. The extreme set influenced the Anti-Democratic Attitude factor. The response set showed negligible effects on Marital Conflict and Strictness factors.

The results of this study will be useful to future users of Mother's PARI. The results, as presented in Table 1, allow one to construct a new Mother's PARI (Q 4)² by selecting from Q1 and Q2 scales that show minimum

² For copies of Q4 of Mother's and Father's PARI, write directly to the authors at the address shown at the end of this article or order NAPS Document No. 02305 from Microfiche Publications, 305 East 46th Street, New York, New York 10017; remit \$1.50 for microfiche or \$5.00 for photocopies.

acquiescence and opposition sets. Such a procedure would greatly reduce the likelihood of obtaining highly inflated scores on scales related to Authoritarian and Psychological Control factors. The investigators suggest the following selection of scales: All 20 scales from Q2 and three scales from Q1 (scales 1, 14, 21, the three scales not found in Q2) may be combined. This procedure would no doubt increase the influence of extreme set. It is considered more desirable in most research studies to minimize the acquiescence and opposition sets than to minimize extreme set. Future users of Mother's PARI may weigh the relative risks of decreasing acquiescence and opposition sets *vs.* increasing extreme sets, and may combine scales from Q1 to Q2 in ways that best suit their research objectives.

REFERENCES

1. BECKER, W. C., & KRUG, R. S. The Parent Attitude Research Instrument—A research review. *Child Devel.*, 1965, **36**, 329-365.
2. BELL, R. Q. Isolation of elevation and scatter components in personality and attitude questionnaires. *Educ. Psychol. Meas.*, 1962, **22**, 699-713.
3. BELL, R. Q., & SCHAEFFER, E. S. Informal notes on the use of PARI. Unpublished mimeographed report, National Institutes of Health, Bethesda, Maryland, 1959.
4. SCHAEFER, E. S., & BELL, R. Q. Development of a parental attitude research instrument. *Child Devel.*, 1958, **29**, 339-361.
5. SCHLUDERMANN, S., & SCHLUDERMANN, E. Conceptualization of maternal behavior. *J. of Psychol.*, 1970, **75**, 205-215.
6. ———. Response set analysis of a paternal attitude research instrument (PARI). *J. of Psychol.*, 1971, **79**, 213-220.
7. ZUCKERMAN, M. Reversed scales to control acquiescence response set in the Parental Attitude Research Instrument. *Child Devel.*, 1959, **30**, 523-532.
8. ZUCKERMAN, M., & NORTON, J. Response set and content factors in the California F Scale and the Parental Attitude Research Instrument. *J. Soc. Psychol.*, 1961, **53**, 199-210.
9. ZUCKERMAN, M., NORTON, J., & SPRAGUE, D. S. Acquiescence and extreme sets and their role in tests of authoritarianism and parental attitudes. *Psychiat. Res. Rep.*, 1958, **10**, 28-45.
10. ZUCKERMAN, M., RIBBACK, B. B., MONASHKIN, I., & NORTON, J. A. Normative data and factor analysis of the Parental Attitude Research Instrument. *J. Consult. Psychol.*, 1958, **22**, 165-171.

Department of Psychology

University of Manitoba

Winnipeg, Manitoba, Canada R3T 2N2

RATED EFFECTIVENESS OF ANTIDRUG LETTERS BY DRUG USERS AND NONUSERS*

Department of Psychology, Ohio University

MARY JO CONTE AND LEONARD W. FERGUSON^{1, 2}

SUMMARY

As part of each of several drug surveys conducted in Ohio high schools, the second-named author of this report and his survey colleagues asked each respondent to write an antidrug letter. Later, they had those letters judged on *persuasiveness* and, on that variable (for 12th graders), found no significant difference between letters written by drug users ($N = 70$) and letters written by nonusers ($N = 174$).

A. INTRODUCTION

On request from each of several Ohio county mental health and mental retardation boards, the second-named author and his student associates conducted drug-use and drug-knowledge surveys in several Ohio counties. In each survey the investigators asked each high school student to answer, upon an anonymous basis, (a) each of 64 or more questions on drug use and (b) each of 78 questions on drug knowledge; also, (c) to complete a personality inventory, and (d) to write an antidrug letter.

Prior to each survey, each student was allowed to select (from a large envelope containing many preprinted, numbered gummed stickers) any ID number he chose; then, he printed that number upon each answer sheet he completed as well as upon his antidrug letter. By reference to each student's unique (but anonymous) ID number, the investigators were able to correlate the answers on any one form with those given by the same student on any

* Received in the Editorial Office on December 17, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Mary Jo Conte, one of the second-named author's student collaborators in conducting drug surveys in Ohio high schools, wrote a term paper as a first draft for this report. The second author revised the paper for publication.

² The second author has had more than 100 students in Public Service Research (Psychology 361 at Ohio University) serve as collaborators in conducting drug surveys in more than 50 Ohio middle schools, junior high schools, and high schools. Other than Ms. Conte, those particularly associated with the project to which this article is devoted were Arthur Argyries, Richard Goldstein, Sherman Hopkins, Norman Koury, Roger McElroy, Kathy Puschaver, Milada Surak, and Paul Walker.

other form. In the present report interest centered on an evaluation of the effectiveness of the antidrug letter in relation to the drug-use habits of the letter writer.

B. METHOD

1. *Instructions for Letter*

The letters that formed the basis for this report were secured from 244 high school seniors in response to the following directions (read, usually, over a schoolwide PA system):

Suppose your brother or sister or best friend were just about to take a drug that you did not think would be good for him or her. Write to that brother or sister or best friend a letter telling him or her why he or she should not take that drug. Make your letter as persuasive as possible because you are the only person who is going to be able to keep your brother or sister or best friend from taking that drug. Do your best to help your sister or brother or best friend to decide *not* to take the drug he or she had in mind.

In their instructions, *Es* mentioned no specific drug and they gave *S* no argument to use; consequently, (a) *S* had to select the drug he was to write against, (b) *S* had to improvise his own argument or arguments, and (c) *S* had to write his thoughts on paper—so others could see what he said. After *S* had written his letter, but before he handed it in (without identifying himself), *Es* requested *S* to name (at the bottom of the letter) the drug he had had in mind when writing the letter.

2. *Instructions for Rating*

To get the antidrug letters rated on persuasiveness, *Es* prepared about 40 packets of the letters, with each packet made to contain nine letters. One letter was common to all packets; the remaining eight letters in each packet were unique (i. e., included in one packet only).

Judges were students enrolled in introductory psychology courses at Ohio University. Each judge was a volunteer, awarded (for his service) two points toward his final course grade. When volunteers reported for duty at a preassigned time and place, *Es* told each volunteer that he was to be a judge of the effectiveness of each letter in a series of letters designed for use in drug-education programs. Each judge was given the following instructions:

(a) He was to read *all* the letters in his packet to become familiar with them.

(b) He was to select as a starter any letter he wished.

(c) He was to reread that letter and decide how effective he thought it as a drug-use deterrent.

(d) He was to assign to that letter (arbitrarily) the value 100 to represent whatever degree of persuasive power he judged that letter to possess.

(e) He was to select a second letter and judge its persuasive power in relation to that of the first—e. g., to assign to the second letter the value 200 if he judged it to be twice as persuasive as the first, or the value 50 if he judged it to be one-half as persuasive as the first, or any other value that represented to him the persuasive value of the second letter in relation to that of the first.

(f) He was to repeat (and to keep repeating) the foregoing steps until he had judged all nine letters.

The foregoing procedure follows one of Underwood's suggested adaptations (6, p. 224) of Stevens's magnitude-estimation technique (5).

3. Analysis

At the end of the school term allotted for collecting the judgmental data, *Es* determined the mean persuasive rating for each of the several hundred letters their judges had rated (for high school students in the 12th grade). To determine for each letter its mean persuasive value, *Es*—following suggestions made by Dr. James T. Webb of Ohio University—proceeded as follows:

(a) They divided the value that each judge assigned to each of the nine letters in his packet by the value he assigned to the common letter (i. e., to the letter that all judging packets contained).

(b) They totaled (across judges) all quotients for a given letter and, for each letter, divided the sum of the quotients by the number of judges providing the ratings for that letter.

(c) They prepared a frequency distribution of the mean ratings assigned to 244 letters found to be rated by three or more judges.

(d) They divided the foregoing raw-frequency distribution into a normalized nine-step distribution containing *stanine* designations from 1 (least persuasive) to 9 (most persuasive) and containing 4%, 7%, 12%, 17%, 20%, 17%, 12%, 7%, and 4% of the letters.

(e) They categorized the letters in the bottom three stanine categories ($N = 53$) as below average letters; the letters in the middle three stanine categories ($N = 137$) as average letters; and the letters in the top three stanine categories ($N = 54$) as above average letters.

C. RESULTS

Table 1 shows the results. Twenty-nine percent of the high school drug users (i. e., current users or former users of marijuana, speed, or LSD) wrote letters judged to be below average in persuasive power. Nineteen percent of the nonusers (of marijuana, speed, and LSD) wrote such letters. Twenty-four percent of the nonusers wrote letters judged to be above average in persuasive power. Seventeen percent of the users wrote such letters. The relation between drug use and persuasive power fails to reach the .05 level of significance ($\chi^2 = 3.29$; $df = 2$), but the results show that the drug user is *not* (contrary to many a claim) the source one should seek should he wish to have an effective antidrug letter prepared.

TABLE 1
RATED PERSUASIVENESS OF ANTIDRUG LETTERS
IN RELATION TO STUDENT'S DRUG USE^a

Rated persuasiveness	Nonusers		Users		Total	
	N	%	N	%	N	%
Above average	42	24	12	17	54	22
Average	99	57	38	54	137	56
Below average	33	19	20	29	53	22
Total	174	100	70	100	244	100

^a $\chi^2 = 3.29$; $df = 2$; $p > .05$. As indicated in the text, letters rated above average are those included in the top three stanine categories of a nine-step distribution; letters rated average are those in the middle three stanine categories; letters rated below average are those in the bottom three stanine categories. Users are students who claim to be current or former users of marijuana, speed, or LSD; nonusers are students who claim never to have used marijuana, speed, or LSD.

D. DISCUSSION

One of the preplanned purposes of the letter-writing exercise was to change (if possible) *S*'s attitude (if he had been or were a drug user or were prodrug) from prodrug to antidrug (or, at least, to less prodrug or to more antidrug). For that reason *Es*—with wise counsel from Gregory Polot (an Ohio University student)—had devised the letter-writing exercise as a role-playing technique in which a drug user or prodrug *S* would have to argue against his own practice or belief and, in doing so, would have to make public his argument or arguments. To keep *S* from balking at the exercise (very few *Ss* did), he was allowed—in fact, forced—to improvise on the spot his own argument or arguments against drug use, but he was allowed (as indicated earlier) free choice of the drug he was to write against.

In the behavioral science literature one can find data implying that (a)

attitudes can be changed by role play (2); (b) attitudes can be changed by forcing a target person to improvise his own arguments against his own position (3); (c) attitudes can be changed by having the target person make public the argument or arguments he chooses to make (1); and (d) attitudes can be changed more effectively if the target person be given some choice in the process (4). Choice—once made—seems to imply commitment: hence, little feeling of being “boxed in.”

Es do not know whether or not the letter-writing exercise achieved its goal so far as attitude change is concerned (a report is to appear on that), but they conclude that the exercise achieved two other preplanned goals: (a) It debunks the idea—propounded by many drug users—that drug users are the “experts” whose counsel should be sought for programs designed to diminish or eliminate illicit drug use, and (b) it provides a source of material for peer-to-peer use in drug-education programs.

REFERENCES

1. ELMS, A. C., & JANIS, I. L. Counter-norm attitudes induced by consonant versus dissonant conditions of role-playing. *J. Exper. Res. Personal.*, 1965, 1, 50-60.
2. JANIS, I. L., & MANN, L. Effectiveness of emotional role-playing in modifying smoking habits and attitudes. *J. Exper. Res. Personal.*, 1965, 1, 84-90.
3. KING, B. T., & JANIS, I. L. Comparison of the effectiveness of improvised versus nonimprovised role-playing in producing opinion change. *Hum. Relat.*, 1956, 9, 177-186.
4. LINDER, D. E., COOPER, J., & JONES, E. E. Decision freedom as a determinant of the role of incentive magnitude in attitude change. *J. Personal. & Soc. Psychol.*, 1967, 6, 245-254.
5. STEVENS, S. S. The direct estimation of sensory magnitudes—Loudness. *Amer. J. Psychol.*, 1956, 69, 1-25.
6. UNDERWOOD, B. J. *Experimental Psychology* (2nd ed.). New York: Appleton-Century-Crofts, 1966.

Department of Psychology
Ohio University
Athens, Ohio 45701

FORCED DEVIATION, CONFORMITY, AND COMMITMENT* 1

Department of Sociology, University of Kentucky

GERALD T. SLATIN

SUMMARY

This paper considers the effects of an initial period of "forced" nonconformity on commitment to an independent position in later trials of an Asch-type experiment. Nonconformity was "forced" in the sense that experimental subjects' choices were made to appear deviant by manipulation of the choices of the fictitious discrepant majority who "responded" after experimental subjects. Compared with control subjects who did not experience initial forced deviation, experimental subjects conformed significantly less during a subsequent block of trials where response order was reversed, thereby allowing them to know the choices of the fictitious majority before giving their choice. When the experiment was interpreted within a symbolic interactionism framework, it was hypothesized that two forms of commitment to an independent position, self-commitment and group-commitment, might follow initial "nonconforming" behavior in the group. Data from postsession interviews suggest self-expectations to be more important than imputed group-expectations in the development of a commitment to an independent position.

A. INTRODUCTION

Social psychology has concerned itself for a number of years with the experimental study of social influence. Much of this research derives from the classic Asch paradigm, which in the last decade or so has generated a substantial body of research [extensive reviews of the literature in this area may be found in Berg and Bass (3), Allen (2), and Kiesler and Kiesler (11)]. Of the various theoretical orientations to the Asch phenomenon that have appeared, one of the most interesting from a sociological standpoint involves the notion of commitment. This approach has resulted in the often subtle translation of earlier, more individualistic psychological explanations

* Received in the Editorial Office on December 19, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ An earlier version of this paper was presented at the annual meeting of the Pacific Sociological Association held in Seattle, April, 1969.

into later formulations which are closely related to the so-called interactionist perspective of contemporary sociology. Thus, past discussions that were typically couched in terms of sensitivity to group pressure in relation to basic personality configurations are gradually being replaced by conceptualizations that focus more on the *total* group and the *social interaction* of the individual with the group.

The study reported here represents the first in a series of investigations into various aspects of a conformity and commitment utilizing a slightly modified Asch procedure and a theoretical approach that stems from certain basic tenets of Meadian social psychology (14). Following earlier work by Deutsch and Gerard (5) and Gerard (6) on the relation between conformity and commitment, our major purpose in this study was to determine the effect of an initial period of simulated nonconformity on subsequent response tendencies.² Specifically, we sought an answer to the question: Does initial "forced" nonconformity produce a tendency to continue to remain independent of the group in the Asch setting? Secondly, we sought to explore the related questions of whether such a tendency results from a sense of "commitment" to an independent position and, if so, exactly what social object does the subject feel committed to—the group or the self?

With regard to the last two issues, it has been suggested by Gerard (6) that, on the one hand, subjects in Asch-type experiments who are independent at the outset tend to remain so to the end of the series of judgments because to conform would presumably elicit a negative sanction from the group for "giving in" and going along with the discrepant majority. On the other hand, if a subject begins by conforming, Gerard suggests that a similar tendency to continue to respond in the same way will operate. In both cases commitment to a position is regarded as stemming from a desire to avoid group censure by maintaining response consistency throughout the experiment. Gerard demonstrated that there is greater adamance and/or yielding

² We use the terms "simulated" or "forced" nonconformity to describe the experimental condition because subjects' nonconformity was achieved by manipulation of their "partners'" (analogous to stooges in the standard Asch experiment) choices so as to create a discrepancy between the subject and his group. It should be emphasized that subjects "forced" to deviate from the group in this way are not doing so voluntarily nor are they being coerced; further, they are likely to experience both negative feelings resulting from being at odds with the group and positive feelings attendant upon relying on one's own judgment in performing a judgmental task, with numerous uncontrolled psychological and sociological factors determining which feelings are more important to the individual. Thus, while such contrived nonconformity bears a resemblance to certain forms of deviant behavior in the real world in terms of these positive and negative aspects, it differs from most "real" deviance in that our subjects had no choice in the matter; in the first half of the trials, experimental subjects always found themselves in a deviant position *vis-à-vis* the group.

in the face-to-face situation than in the anonymous Asch situation where subjects are provided information about one another's choices on panels of lights; he attributes this to the fact that the feeling of commitment is heightened in public settings because a subject's vulnerability to group censure is greater when he is visible to the group.

In an effort to elaborate the process of commitment development further, we think it fruitful to deal with this process in terms of symbolic interaction theory. Commitment, it seems from this perspective, involves two sets of expectations on the part of ego: (a) expectations concerning his own behavior; and (b) expectations about how alter will interpret and react to his behavior. In the first instance, we are referring to the way in which people expect themselves to behave: i. e., the behavior patterns dictated by their enduring self-conceptions which are brought into the experiment from the outside. The Asch setting would seem to produce a conflict relevant to one important aspect of an individual's self-concept—the confidence he has in his ability to make judgments of the kind called for in these experiments. Numerous studies have shown that self-esteem, for example, plays an important role in determining conformity to the group (*cf.* 4, 10, 12). Individuals who have high self-esteem tend to remain independent of the group, while low self-esteem appears to produce conformity. Thus, both yielding and independent subjects can be thought of as behaving in accordance with their conceptions of self; their behavior is consistent with their expectations about themselves, and their commitment is *inner-directed*.

Expectations about alter's evaluations and interpretations of ego's behavior are involved in the second aspect of commitment. Here the obligation that is thought to develop would seem to depend on how the individual feels others in the situation will regard his actions. As pointed out earlier, subjects are said to feel compelled to continue to respond in the same way, either agreeing or disagreeing with the group, because they assume that the group will react negatively to inconsistent behavior; i. e., they desire to avoid a negative "situated identity" (1) by being consistent in either their independence or conformity *vis-à-vis* the group. Although this latter form of commitment contains a large measure of the self in terms of the individual wanting to preserve a positive image of self in relation to the group, it is, however, primarily *other-directed* and presumably arises out of real, imagined, or anticipated social interaction with the other group members and/or experimenter.

Thus, in Meadian terms, commitment to a position, whether it be conforming or independent, may be viewed as developing along two, possibly

overlapping, lines which both have their genesis in varying degree in the social interaction between ego and alter. On the one hand, the "social" exchange between ego and alter is seen as simply a social "occasion" which activates certain enduring self-expectations that ego has, and the nature of the interaction setting gives meaning and direction to these expectations. For example, a subject might remain independent of the group because he defines himself as the kind of person who "never goes along with others," or as the kind of person who "always relies on his own judgment," two different but related cognitive reasons for the same overt behavior. On the other hand, the interactionist is likely to be more interested in the second line of development which stresses the crucial role played by alter in the development of ego's expectations and eventual commitment to the group: i. e., desire to behave in a manner that ego takes to be consistent with what alter expects of him.³

Through modification of the Asch design, we attempted to assess the importance of the individual's initial behavior for the subsequent development of a commitment to an independent position. We hypothesized that subjects whose choices during the first half of a conformity experiment had been made to appear discrepant in relation to the majority would tend to remain independent during the last half of the trials: that is, continue to give choices that were different from those of the majority. On the assumption that the data supported the tenability of this basic hypothesis, we would then turn to the question of whether the experimentally induced response tendency could be attributed to subjects' feelings of commitment deriving from self-expectations or imputed group expectations.

B. METHOD

1. Subjects

Forty undergraduate volunteer male and female subjects from four different sections of three introductory sociology courses were randomly selected from a larger pool of students who had indicated on a questionnaire that they had never participated in any psychology or sociology experiments. In

³ It seems likely that both aspects of commitment are present in conformity experiments but at different points in time. Subjects' initial responses are perhaps determined to a great extent by the self-concept dimension of commitment. Individuals who carry positive self-concepts with them into these experiments apparently have a tendency to rely on their own judgment to make the correct choice, and they rarely conform to the group. However, once an initial position relative to the group is established, this behavior could then serve as a basis for imputed group expectations regarding future behavior and, in doing so, could lead a change from self-commitment to commitment to the group. Research is needed that will shed some light on the developmental nature of the commitment process.

addition, an attempt was made to further insure the use of naive subjects by using only students who had had no more than one previous course in psychology or sociology. Subjects were randomly assigned in groups of four to experimental and control conditions. Insofar as possible, each four-person group was made up of individuals from different class sections in order to minimize the possibility of friends being assigned to the same group; also all groups were homogeneous with respect to sex.

Data are reported for 37 of the total group of 40 subjects. Two groups had to be run with only three persons (with a research assistant filling in for the no-show subjects) because of failure of two subjects to appear. A third subject had to be eliminated because he revealed in the postsession interview that he knew of the Asch studies and had suspected from the outset that he was participating in an Asch-type experiment. A major purpose of the postsession interview was to get some indication of the suspicion rate among subjects. Although most subjects indicated that they had been puzzled by the answers their partners gave, their suspicions as to the truth of the instructions and cover story were extremely vague. With the one previously mentioned exception, all subjects appeared to be convinced at the end of the session of the "honesty" of their partners' choices. Subjects developed many hypotheses to explain the pattern of responses and the glaring differences, but in only one case was a subject positively convinced that his partners' choices were "rigged." [Subsequent research by this writer into sources of contamination has revealed other more subtle aspects to the problem of nonnaivety; see Glinski, Glinski, and Slatin (9).]

2. Experimental and Control Conditions

Each four-person group participated in 36 trials of an anonymous version of the Asch experiment utilizing a Crutchfield-type apparatus (4). Subjects sat in separate booths and responded by pressing buttons on a panel of lights. Subjects were told that their choices were displayed on their panels as well as on their partners' panels. Actually each subject's choice was displayed on his panel and on a master panel in another room. Subjects did not actually observe the choices of their partners, but rather a programmed set of choices controlled from the master panel by the experimenter.

Subjects were informed by the experimenter that they were participating in a study designed to test their ability to make auditory discriminations. Their task, they were told, was to listen to a series of three groups of clicks or beats which they would hear over a loudspeaker; to select the group of clicks that contained the greatest number of clicks; and to indicate their

choice of group 1, 2, or 3 by pressing one of the three buttons on their panels. A tape was prepared with use of an electronic metronome to generate 18 three-group series of clicks. The number of clicks in each group of the triad varied from five to 10. The beat or speed with which clicks were presented was sufficiently fast to make counting difficult but not impossible. Each triad contained two groups with equal numbers of clicks and a third randomly placed group containing one additional click. Errors in selecting the correct group were less than 1%. The same 18 triads were used for both blocks of 18 trials; no subject recognized the second series of trials as being identical to the first.

The distinction between experimental and control conditions involved the order in which subjects responded on the first block of trials. After reading the instructions to the subjects, the experimenter gave each subject a card bearing his subject number. Although subjects were led to believe that they and their three partners had each been given different numbers, subjects were actually assigned the same number: number 1 in the case of the five experimental groups and number 4 for the five control groups, for the first 18 trials. Subjects were told to respond in the order in which they were numbered. Thus experimental group subjects responded first followed by the three "choices" of their partners. Because the experimenter could vary the choices of a subject's partners depending on the response the subject gave, it was possible to force the subject into a nonconforming position on a trial simply by means of the programmed choices fed to him from the master panel. A random schedule was used to determine what partners' choices were fed back given the subject's choice on each trial. Fourteen of the 18 trials were critical in that it was made to appear that the subject's partners all gave the same but different (from subject) choice.

At the conclusion of the first 18 trials, the experimental groups were told that the second half of the experiment would be similar to the first except that each subject would be assigned a different number and would therefore respond at a different time. All experimental subjects were assigned number 4 and responded last, thus being given the opportunity to observe their partners' "choices" before answering and conform if they so desired. The randomized feedback schedule for the second block also contained 14 critical trials on which partners' choices were unanimous but different from subjects'.

The procedure for the five control groups differed in that the subjects responded last on both blocks of trials. The break at the end of the first 18 trials was explained to these subjects as being necessary to recycle the

equipment. Although control and experimental groups were to be compared in terms of the number of conforming responses for the 14 critical trials of the second or test block only, it was felt that control subjects should undergo the first 18 trials in order to eliminate any differential in practice or fatigue effects that might have resulted from the two groups not running the same number of trials.

Subjects in both conditions were told that they would not be given any information as to the correctness of their choices during the experiment, but that they would be able to compare their answers with those of the other members of the group by means of the lights on their panels. There was no suggestion that this was a *group* task: nothing was mentioned about a group score. The experimenter left the room after reading the instructions. Although subjects probably assumed that their responses were being recorded, this point was not made in the instructions.

C. RESULTS

Table 1 presents the distributions of conforming responses for both groups; this table shows the number of subjects in each group who made from zero to 14 (the maximum possible) conforming responses on the second block of trials. In accordance with our original hypothesis, we find that the experimental group, which underwent the initial period of forced deviation, tended to remain independent on the second block of trials. The number of conforming responses for experimental group subjects is significantly less than that of control group subjects as measured by Mann-Whitney U ($U = 117.5$, with correction for ties; $p < .05$, one-tailed test). An inspection of Table 1 reveals that although there were more experimental subjects with zero conforming responses (indicating complete independence), there were six experimental subjects who made one or more conforming responses. In fact, one of these subjects conformed on nine of the 14 critical trials. Thus, although the general tendency was for initial forced deviation experience to produce more nonconforming behavior, it by no means produced complete independence.

Further data are provided from the postsession interviews. In addition to having the purpose of uncovering suspicious subjects, these interviews were intended to reveal whether or not commitment was present and, if it was, the exact nature of the commitment. We particularly wanted to elicit subjects' thoughts, reactions, experiences, etc., that occurred to them during the session. Such subjective data are important in studies of this type because of the lack of independent measures of commitment. The dependent

TABLE 1

DISTRIBUTIONS OF CONFORMING RESPONSES: CONTROL AND EXPERIMENTAL GROUPS

Number of conforming responses (x)	Frequency of conforming responses (f)	
	Control ($N = 18$)	Experimental ($N = 19$)
0	8	13
1	1	2
2	2	2
3	1	1
4	3	0
5	1	0
6	1	0
7	0	0
8	0	0
9	0	0
10	0	1
11	1	0
12	0	0
13	0	0
14	0	0
Total (Σfx)	42	18
Mean ($\Sigma fx/n$)	2.33	.95

variable, in this case the relative number of nonconforming responses, is frequently taken as the sole evidence of commitment to an independent position. However, a tautology is created when one points to commitment as the *cause* of the independent behavior. We hoped to overcome this limitation partially by drawing on subjects' reports to detect any additional differences between groups.

Several open-ended and semistructured questions designed to reveal whether subjects felt committed to the group in any sense failed to produce clear evidence of this. Responses to items relating to how subjects felt about their behavior *vis-à-vis* the group and to their decision strategy provided indirect evidence as to the effect of initial forced deviation on subjects' concern for alters' expectations. The main differences between the two groups seemed to involve the reaction of subjects to their "deviance" in relation to their partners and also the manner in which subjects decided their choice when in doubt.

In response to the question "Were you bothered by the fact that sometimes your choices did not agree with your partners?" five (26%) of experimental group subjects compared to 12 (67%) of control group subjects indicated that they were "not bothered." This difference yields a chi square (with Yates's correction) of 4.6 which is significant at beyond the 5%

level. One subject's comment on this point is indicative of the general reaction to the simulated nonconformity condition. She stated as follows:

I got used to being different during the first half of the experiment, and I wasn't bothered by the fact that my answers were different during the second half. I didn't expect myself to go along with the group then. It seemed natural for me to give different answers most of the time.

Also, this subject was typical of the other experimental group members in that she reported that she "never worried about how the others might have expected me to respond." The main concern of this subject and the others who experienced the experimental manipulation was to give the correct answer without apparent regard for how their action might be interpreted by the group.

Further evidence of the relative unimportance of the group for those subjects who experienced forced deviation is found in the responses to a question regarding decision strategy. When asked "Did you refer to the light panel to check your partners' choices before responding during the second half of the experiment?" 15 (83%) of control subjects *versus* seven (37%) of experimental subjects answered affirmatively, a significant difference as measured by chi square (with Yates's correction, $\chi^2 = 6.4$, $p < .05$). Control group subjects also indicated that they attended more often to alter's choices in answer to the question "How did you go about making a decision on trials where you may not have been sure of the correct choice?" Control subjects generally reported that they relied on their partners' choices; in contrast, most experimental subjects reported that they simply guessed the answer when not certain.

D. DISCUSSION

Symbolic interaction theory suggests that expectations are an important element of commitment and, further, that a person's actions serve as a major basis for expectations that the person holds about himself and that he perceives others to hold about himself. Commitment is generally thought to involve one or sometimes both sets of expectations, although the exact relationship between the two sets and/or which set is thought to be operating in particular experiments is frequently not specified. The results of this study indicate that (a) subjects in an anonymous version of an Asch-type experiment who experience an initial period of simulated nonconformity appear to form expectations about their own subsequent behavior, and (b)

these expectations seem to be instrumental in the development of a response tendency to remain independent of the group.

The question of whether these subjects failed to go along with the group because they were (a) "committed" to an independent position in the sense that they believed their behavior to be congruent with the group's expectations of their continued nonconformity (other-directed commitment), or (b) "committed" to an independent position because deviation from the group was congruent with the personal expectations that were built up in the situation (inner-directed commitment), remains problematic given our limited data. The qualitative data suggest, however, that of the two sets of expectations the inner-directed was the more salient for the experimental subjects of this study; i. e., the independent mode of response seemed to be due to expectations that subjects felt about themselves, not expectations that they imputed to the group. In short, the group did not appear as a "significant other" to whose expectations subjects felt a desire to conform. If the group served any function at all, it was probably merely as a discrepant majority which acted as a background or norm against which experimental subjects compared their responses, thus giving direction or quality to their self-expectations.

It should be noted that this finding regarding relative importance of self *versus* group expectations could easily be an artifact of the anonymity feature of our procedure. It is difficult to imagine a strong commitment to the group developing in a situation where members are not in fact publicly identifiable within the group; as Gerard (6, 7) and others have hypothesized, the threat of a negative group evaluation of inconsistent behavior or behavior that implies "giving in" to the group is probably very slight in nonpublic interaction settings, thus minimizing the sensitivity of subjects to group expectations. We are currently studying the validity and generality of this hypothesis under the condition of forced deviation with data from face-to-face groups.

In conclusion it is necessary to mention another important limitation of this study, and in so doing so, explore several implications and suggestions for further research utilizing the basic forced-deviation design described in this report.

As indicated earlier, a discussion of expectations that an individual holds about himself rests heavily on the theory of the self, specifically in this case the symbolic interaction version of the self. The fact that no data on subjects' self-conceptions were collected in this study prevents empirical testing of important symbolic-interaction-derived hypotheses concerning relationships

between self-conceptions and behavioral tendencies in Asch-type settings. However, certain features of our data and design have led us to speculate concerning the relationship between self-conceptions and the response tendencies observed in this experiment; we briefly consider here two possibilities involving this relationship.

First, forced deviation may act to strengthen already-existing self-attitudes and images that predispose an individual to take up a position of independence. It is interesting to note in this regard that two experimental group subjects offered the unsolicited comment to the postsession interviewer that they considered themselves to be "independent" or "independent thinkers" in most group situations and "usually never went along with the group"; these same subjects evidenced a tendency to remain independent of the group even when it meant giving a wrong choice on two noncritical trials where their "partners" were presented as agreeing unanimously on the obviously correct answer. These subjects were questioned about their choices on these two trials, but it is unclear from their answers whether these were instances of *anticonformity* (intentionally and knowingly giving the wrong answer—i.e., stubbornly refusing to conform) or instances of what might be called *disconformity*—i. e., giving the wrong answer but believing it to be correct because of a kind of perceptual distortion that results from the independent subject's tendency to become preoccupied with the subjective and/or social meaning of his choices rather than their veridicality. Whatever the basis for such independent behavior, it is clearly a response pattern that deserves careful study through the development of designs and methods that facilitate its analysis as well as the usual conformity score analysis [see Stricker *et al.* (15) for a discussion of the importance of studying anticonformity and other forms of independence].⁴

A second possible effect of initial forced deviation requiring further study is that it may act to override certain deep-seated self-conceptions, thereby causing persons who normally would be inclined to yield to group influence to remain, in fact, independent of the group during the second block of trials. (The fact that there was evidence of some conforming behavior in the experimental group indicates that perhaps a residual tendency to conform remained for those subjects who initially might have been predisposed to yield because of low self-esteem or other conformity-producing self-images; this seems to be

⁴ The growing subcultural emphasis placed on nonconformity (albeit a conforming nonconformity) by the current student population (from which is drawn the majority of subjects for conformity experiments) perhaps is another reason for shifting attention from conforming behavior as a topic of inquiry to the study of ways in which individuals avoid conformity in group situations.

a most tenable hypothesis in the case of the one experimental subject who conformed on nine of the 14 critical trials.) While personal consistency theory (8, 13), specifically, and symbolic interaction theory, more generally, would seem to have difficulty accounting for such incongruity between self-conceptions and actual situated behavior, a seminal essay by Turner (16) provides a clue as to how the symbolic interactionist might analyze the kind of discrepancy we see as possibly occurring in this type of experiment.

Turner seeks to refine and clarify the concept of self and its function in social interaction; in doing so, he distinguishes between *self-conceptions* as the enduring "I-myself as I really am" picture an individual carries around with him, and *self-images* as the fleeting, changing snapshots he has of himself in concrete situations. Several self-images may be in effect simultaneously in any situation, Turner states, and "many self-images will be rejected as false, unrepresentative, and unfair" (16, p. 94). In task-directed interaction (as opposed to identity-directed interaction) the individual tends not to be aware of self-images and/or possible discrepancies between them and self-conceptions. In short, there is an absence of self-consciousness thereby rendering unproblematic any lack of congruence between nonconforming self-images and conforming self-conceptions.

However, if an individual becomes aware of gross discrepancies between the two dimensions of the self, Turner says there is a tendency for him to become identity-directed; i. e., his gestures become devices of interpersonal technique rather than means of communicating at a face-level (16, pp. 103-104). Negatively discrepant self-images can force the person to revise his self-conception downward, while positively discrepant self-images "threaten" the person in the opposite way, forcing him to revise his self-conception upward. In either case, this line of analysis suggests that subjects may react to the problem of incongruity between self-conceptions and self-images by modifying the former so as to bring them in line with the latter, especially, it would seem, when this strategy would have the effect of enhancing the self-conception. Such is probably the case for subjects who have a propensity to yield to group influence but who become committed to an independent position *vis-à-vis* the group following initial forced deviation and who perceive a discrepancy between self-conceptions and situated self-images. Because of the generally positive value that most people place on not giving in to group pressure, these subjects' self-conceptions would in effect be enhanced through the use of this revision strategy, suggesting the hypothesis that a comparison of pre- and postmeasures of their self-esteem would reveal an upward displacement on this dimensions.

These and numerous other issues must be investigated before the social psychologist begins to understand fully the extent to which an individual's feelings of self, his expectations, his degree of commitment, indeed his enduring behavioral predispositions have their genesis in social interaction. It is felt that some of the important questions in this area are those that can be answered by further studies utilizing self-concept and related data within the context of the forced deviation design.

REFERENCES

1. ALEXANDER, C. N., JR., & WEIL, H. G. Players, persons, and purposes: Situational meaning and the prisoner's dilemma game. *Sociometry*, 1969, **32**, 121-141.
2. ALLEN, V. L. Situational factors in conformity. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (vol. 2). New York: Academic Press, 1965.
3. BERG, I. A., & BASS, B. M. Conformity and Deviation. New York: Harper, 1961.
4. CRUTCHFIELD, R. S. Conformity and character. *Amer. Psychol.*, 1955, **10**, 191-198.
5. DEUTSCH, M., & GERARD, H. B. A study of normative and informational social influences upon individual judgment. *J. Abn. Psychol.*, 1955, **51**, 629-636.
6. GERARD, H. B. Conformity and commitment to the group. *J. Abn. Psychol.*, 1964, **68**, 209-211.
7. ———. Deviation, conformity, and commitment. In I. D. Steiner & M. Fishbein (Eds.), *Current Studies in Social Psychology*. New York: Holt, Rinehart & Winston, 1965. Pp. 263-277.
8. GERGEN, K. J. Personal consistency and the presentation of self. In C. Gordon & K. J. Gergen (Eds.), *The Self in Social Interaction*. New York: Wiley, 1968. Pp. 299-308.
9. GLINSKI, R. J., GLINSKI, B. C., & SLATIN, G. T. Nonnaivety contamination in conformity experiments: Sources, effects, and implications for control. *J. Personal. & Soc. Psychol.*, 1970, **16**, 478-485.
10. JANIS, I. L. Personality correlates of susceptibility to persuasion. *J. Personal.*, 1954, **22**, 504-518.
11. KIESLER, C. A., & KIESLER, S. B. Conformity. Reading, Mass.: Addison-Wesley, 1969.
12. LEAGUE, B., & JACKSON, D. N. Conformity, veridicality, and self-esteem. *J. Abn. & Soc. Psychol.*, 1964, **68**, 113-115.
13. LECKY, P. Self-Consistency: A Theory of Personality. New York: Island Press, 1945.
14. MEAD, G. H. Mind, Self, and Society. Chicago: Univ. Chicago Press, 1934.
15. STRICKER, L. J., MESSICK, S., & JACKSON, D. N. Conformity, anti-conformity, and independence: Their dimensionality and generality. *J. Personal. & Soc. Psychol.*, 1970, **16**, 494-507.
16. TURNER, R. H. The self-conception in social interaction. In C. Gordon & K. J. Gergen (Eds.), *The Self in Social Interaction*. New York: Wiley, 1968. Pp. 93-103.

Department of Sociology
University of Kentucky
Lexington, Kentucky 40506

(Founded in 1935 by Carl Murchison)

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

ARTHUR G. BILLS
University of Cincinnati

E. A. BOTT
University of Toronto

LEONARD CARMICHAEL
National Geographic Society

IRVIN L. CHILD
Yale University

HERBERT S. CONRAD
U. S. Office of Education

JOHN F. DASHIELL
Florida State University

LEONARD W. DOOB
Yale University

If this space should be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special
edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

FRANK A. GELDARD
Princeton University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

DAVID HOTHERSALL
Ohio State University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

WARREN H. TEICHNER
New Mexico State
University

LEE EDWARD TRAVIS
Fuller Theological
Seminary

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

VOLUME 86

1974

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Published at 2 Commercial Street, Provincetown, Mass.

Printed at 2 Commercial Street, Provincetown, Massachusetts 02657

AUTHOR INDEX

Berry, Franklin M.	131	Kleinbans, Bruce R.	235
Blumberg, Herbert H.	165	Kritzer, Herbert M.	165
Boone, Louis E.	197	Lavelly, Carolyn	247
Breedlove, Carolyn J.	181	Linder, Wayne K.	115
Brekke, Beverly	65	Liska, Allen E.	217
Brown, D. E., Jr.	149	Magnusson, David	81
Bruce, Patricia	303	Matteson, Roberta	35
Carroll, Robert M.	235	McGinnies, Elliott	17
Cicirelli, Victor G.	181	McGowan, Robert W.	57
Cline, Cindy J.	235	McWilliams, Jettie M.	203
Conte, Mary Jo	335	Merica, John	247
Conville, Richard L.	93	Miller, Charles K.	261
Cronen, Vernon E.	93	Mueller, Daniel J.	105
D'Alo, JoAnne	87	Myers, David G.	287
Deckers, Lambert	309	Nowicki, Stephen, Jr.	277
Di Marco, Nicholas J.	13	Obitz, Frederick W.	139
Dlugokinski, Eric L.	71	Patty, Rosemarie Anderson	173
Doob, Leonard W.	313	Pedersen, Darhl M.	57
Duke, Marshall P.	277	Pine, Steven M.	235
Duncan, Edward M.	131	Powell, George D.	111
Edmonds, Ed M.	293	Primavera, Louis H.	61
Edwards, Bill C.	203	Schlagel, Judith	191
Edwards, Darrel	149	Schludermann, Eduard	327
Ekehammar, Bo	81	Schludermann, Shirin	327
Epting, Franz R.	229	Shaheen, Joyce	277
Evans, Robert C.	123	Silverman, Stuart	247
Ferguson, Leonard W.	335	Simon, William E.	61
Ferrell, Marcia M.	173	Slatin, Gerald T.	341
Follman, John	247	Smeets, Paul M.	269
Goldberg, Carlos	157	Smith, Roger C.	241
Greenberg, Gary	251	Stark, Patricia A.	25
Greenhaus, Jeffrey H.	53	Stephens, Beth	261
Gunderson, E. K. Eric	149	Stimpson, David V.	87
Hare, A. Paul	165	Striefel, Sebastian	269
Harris, Mary B.	123	Suchman, David I.	229
Hartlage, Lawrence C.	191	Taylor, W. R.	149
Himelstein, Howard C.	251	Thornton, Jerry W.	111
Hochman, Sidney H.	61	Tipton, Robert M.	209
Horne, E. P.	115	Tolor, Alexander	297
Howland, Ann	229	Traxler, Anthony J.	25
Jarman, Boyd O.	57	Unmacht, John J.	139
Jenkins, Larry	209	Ward, Charles D.	17
Joesting, Joan	49	Weiss, Steven L.	71
Joesting, Robert	49	Williams, John D.	65
Judah, Ronald	131	Wulf, Kathleen M.	3
Kapnick, Philip L.	13	Zumoff, Larry	261
Kizer, Philip	309		

TABLE OF CONTENTS

A study of Ausubel's proactive hypothesis	3
BY KATHLEEN M. WULF	
Relationship of life style and interpersonal need orientation	13
BY NICHOLAS J. DI MARCO AND PHILIP L. KAPNICK	
Persuasive effects of early and late mention of credible and noncredible sources	17
BY CHARLES D. WARD AND ELLIOTT MCGINNIES	
Empirical validation of Erikson's theory of identity crises in late adolescence	25
BY PATRICIA A. STARK AND ANTHONY J. TRAXLER	
Adolescent self-esteem, family communication, and marital satisfaction	35
BY ROBERTA MATTESON	
Correlations among women's views of contraception, anxiety, creativity, and equalitarian measures	49
BY JOAN JOESTING AND ROBERT JOESTING	
Career salience as a moderator of the relationship between satisfaction with occu- pational preference and satisfaction with life in general	53
BY JEFFREY H. GREENHAUS	
Effects of a competitive endurance training program on self-concept and peer approval	57
BY ROBERT W. MCGOWAN, BOYD O. JARMAN, AND DARHL M. PEDERSON	
Nonverbal rigidity and its relationship to performance on three standard reversible figures	61
BY LOUIS H. PRIMAVERA, WILLIAM E. SIMON, AND SIDNEY H. HOCHMAN	
Conservation and reading achievement of second grade bilingual American Indian children	65
BY BEVERLY BREKKE AND JOHN D. WILLIAMS	
Parental expectations of psychotherapy	71
BY STEVEN L. WEISS AND ERIC L. DLUGOKINSKI	
Relative contributions of different sources of variance to confidence ratings	81
BY BO EKEHAMMAR AND DAVID MAGNUSSON	
Dogmatism, attitude extremity, and attitude intensity as determinants of percep- tual displacement	87
BY DAVID V. STIMPSON AND JOANNE D'ALO	
The effects of negative affect conditions and concept involvement on language redundancy	93
BY RICHARD L. CONVILLE AND VERNON E. CRONEN	
The relationship of political orientation to the values of freedom and equality	105
BY DANIEL J. MUELLER	
The effect of contingent shock (punishment) on the performance of a paired- associates learning task	111
BY JERRY W. THORNTON AND GEORGE D. POWELL	
Subject sensitivity to color in estimation of dot frequency for samples of color normal and color defective males	115
BY E. P. HORNE AND WAYNE K. LINDER	
The effects of modeling and instructions on creative responses	123
BY MARY B. HARRIS AND ROBERT C. EVANS	
Picture recognition by preschool children	131
BY FRANKLIN M. BERRY, RONALD JUDAH, AND EDWARD M. DUNCAN	

Verbal discrimination task performance as a function of self <i>versus</i> external reinforcement, I-E scale performance, and subject <i>versus</i> experimenter determination of response	139
By JOHN J. UNMACHT AND FREDERICK W. ÖBITZ	
The relationships among professional performance ratings, clinical decisions, and clinical outcomes in psychiatry	149
By W. R. TAYLOR, D. E. BROWN, JR., DARREL EDWARDS, AND E. K. ERIC GUNDERSON	
Sex roles, task competence, and conformity	157
By CARLOS GOLDBERG	
The General Survey: A short measure of five personality dimensions	165
By HERBERT M. KRITZER, A. PAUL HARE, AND HERBERT H. BLUMBERG	
A preliminary note on the motive to avoid success and the menstrual cycle	173
By ROSEMARIE ANDERSON PATTY AND MARCIA M. FERRELL	
Women's fear of success in relation to personal characteristics and type of occupation	181
By CAROLYN J. BREEDLOVE AND VICTOR G. CICIRELLI	
Teacher characteristics associated with student classroom behaviors	191
By LAWRENCE C. HARTLAGE AND JUDITH SCHLAGEL	
Personality and innovative buying behavior	197
By LOUIS E. BOONE	
Perceiver sex and expressor sex as related to cognitive perception	203
By BILL C. EDWARDS AND JETTIE M. MCWILLIAMS	
Altruism as a function of response cost to the benefactor	209
By ROBERT M. TIPTON AND LARRY JENKINS	
Attitude-behavior consistency as a function of generality equivalence between attitude and behavior objects	217
By ALLEN E. LISKA	
Cognitive structure and performance on classroom material	229
By FRANZ R. EPTING, DAVID I. SUCHMAN, AND ANN HOWLAND	
Judged seriousness of Watergate-related crimes	235
By ROBERT M. CARROLL, STEVEN M. PINE, CINDY J. CLINE, AND BRUCE R. KLEINHANS	
Response bias in the state-trait anxiety inventory: Detecting the exaggeration of stress	241
By ROGER C. SMITH	
Student raters' referents in rating college teaching effectiveness	247
By JOHN FOLLMAN, CAROLYN LAVELY, STUART SILVERMAN, AND JOHN MERICA	
The effect of increasing reading rate on comprehension	251
By HOWARD C. HIMELSTEIN AND GARY GREENBERG	
A comparison of reasoning skills and moral judgments in delinquent, retarded, and normal adolescent girls	261
By CHARLES K. MILLER, LARRY ZUMOFF, AND BETH STEPHENS	
Elimination of subtraction errors by contingent self-correction in retarded children	269
By PAUL M. SMEETS AND SEBASTIAN STRIEFEL	
The determination of locus of control in a geriatric population and a subsequent test of the social learning model for interpersonal distances	277
By MARSHALL P. DUKE, JOYCE SHAHEEN, AND STEPHEN NOWICKI, JR.	

Interpersonal comparison processes in choice dilemma responding	287
BY DAVID G. MYERS	
Some developmental characteristics of schematic concept formation . . .	293
BY ED M. EDMONDS	
Alienation as measured by three different instruments	297
BY ALEXANDER TOLOR	
Reactions of preadolescent girls to science tasks	303
BY PATRICIA BRUCE	
A note on weight discrepancy and humor	309
BY LAMBERT DECKERS AND PHILIP KIZER	
The analysis and resolution of international disputes	313
BY LEONARD W. DOOB	
Response set analysis of Mother's form of Parental Attitude Research Instrument (PARI)	327
BY SHIRIN SCHLUDERMANN AND ÉDUARD SCHLUDERMANN	
Rated effectiveness of antidrug letters by drug users and nonusers	335
BY MARY JO CONTE AND LEONARD W. FERGUSON	
Forced deviation, conformity, and commitment	341
BY GERALD T. SLATTIN	

ABBREVIATIONS OF WORDS USED IN THE TITLES OF JOURNALS

(One-word titles are never abbreviated. The word "the" is not used, nor its equivalent in any other language. The word "of" or its equivalent in other languages is used only to discriminate what would otherwise be identical titles in different languages. The word "and" is always used, but indicated by "&" in the Roman alphabet. Only English words are indicated here, but the corresponding words in other languages should receive a corresponding abbreviation. All abbreviations and all one-word titles should be in italics.)

Abnormal	<i>Abn.</i>	Japanese	<i>Jap.</i>
Abstracts	<i>Abst.</i>	Journal	<i>J.</i>
American	<i>Amer.</i>	Mathematical	<i>Math.</i>
Anatomy	<i>Anat.</i>	Measurement	<i>Meas.</i>
Animal	<i>Anim.</i>	Medical	<i>Med.</i>
Applied	<i>Appl.</i>	Mental	<i>Ment.</i>
Archives	<i>Arch.</i>	Monographs	<i>Monog.</i>
Association	<i>Assoc.</i>	Neurology	<i>Neurol.</i>
Attitude	<i>Attit.</i>	Opinion	<i>Opin.</i>
Australian	<i>Aust.</i>	Orthopsychiatry	<i>Orthopsychiat.</i>
Behavior	<i>Behav.</i>	Personality	<i>Personal.</i>
British	<i>Brit.</i>	Personnel	<i>Person.</i>
Bulletin	<i>Bull.</i>	Philosophy	<i>Philos.</i>
Bureau	<i>Bur.</i>	Physics	<i>Phys.</i>
Canadian	<i>Can.</i>	Physiology	<i>Physiol.</i>
Character	<i>Charac.</i>	Proceedings	<i>Proc.</i>
Children	<i>Child.</i>	Psychiatry	<i>Psychiat.</i>
Chinese	<i>Chin.</i>	Psychoanalysis	<i>Psychoanal.</i>
Clinical	<i>Clin.</i>	Psychology	<i>Psychol.</i>
College	<i>Coll.</i>	Psychosomatic	<i>Psychosomat.</i>
Comparative	<i>Comp.</i>	Quarterly	<i>Quart.</i>
Consulting	<i>Consult.</i>	Religious	<i>Relig.</i>
Contributions	<i>Contrib.</i>	Research	<i>Res.</i>
Development	<i>Devel.</i>	Review	<i>Rev.</i>
Educational	<i>Educ.</i>	School	<i>Sch.</i>
Experimental	<i>Exper.</i>	Science	<i>Sci.</i>
General	<i>Gen.</i>	Social	<i>Soc.</i>
Genetic	<i>Genet.</i>	Statistics	<i>Stat.</i>
Indian	<i>Ind.</i>	Studies	<i>Stud.</i>
Industrial	<i>Indus.</i>	Teacher	<i>Teach.</i>
International	<i>Internat.</i>	University	<i>Univ.</i>
Italian	<i>Ital.</i>		

Preparation of Manuscripts for The Journal Press

GENERAL INSTRUCTIONS

1. The proper sequence for the parts of your submitted manuscript is as follows: (a) text references, (c) footnotes, (d) tables, (e) figures, and (f) figure legends. However, monographs start with a table of contents and may have an acknowledgment page before the text and an appendix immediately after the text.
2. Use heavy typewriter paper, $8\frac{1}{2} \times 11$ inches, double-space *all* lines, and leave margins for editorial work. Do not use onionskin, odd sizes, and abrasive or wax finishes.
3. Submit original typewritten version and one copy. Retain second copy for proofing.
4. Retype any page on which written corrections have been made.
5. Do not begin a sentence with a numeral.
6. A summary at the beginning of the text is required for articles over 500 words.
7. Each quotation should indicate the page number of the original source. The original publisher must give permission for lengthy quotations and use of tables or figures.
8. Do not fold your manuscript.
9. Enclose a submission letter, with a statement that the manuscript is not under consideration elsewhere. If you are unknown to the Editors, kindly give your credentials.

FORMAT AND SPECIFIC INSTRUCTIONS

A. TEXT DIVISIONS

I. THE TITLES OF JOURNAL ARTICLES AND THE MAJOR SUBDIVISIONS OF MONOGRAPHS ARE PRINTED IN TEN-POINT CAPS CENTERED ON THE PAGE

THE NEXT SUBDIVISION TITLE IS PRINTED IN CAPS AND SMALL CAPS CENTERED ON THE PAGE

1. Then *Italics, with Principal Words, Upper and Lower Case, Centered on the Page*
 - a. Then *italics, upper and lower case, 1-em run-in side head.*
 - (1). Then *italics, upper and lower case, 2-em run-in side head.*
 - (a). Then *italics, upper and lower case, 3-em run-in side head.*

[Further subdivision should be merged into the text without marginal indentation, and could be numbered with small letters.]

B. REFERENCES

References should be arranged in alphabetical order by author, numbered and referred in the text by number (2). Double-space!

The proper form of a book reference is as follows:

DOE, J. The Preparation of Manuscripts. New York: Holt, 1963. Pp. 400-418.

The proper form of a journal reference is as follows:

DOE, J. The preparation of manuscripts. *J. Gen. Psychol.*, 1963, 68, 450-462.

If in the text it is desirable to refer to a page, thus (2, p. 45).

C. FOOTNOTES

Use as few as possible and number consecutively in the text thus.¹

¹ Footnote (on the separate footnote page). Double-space!

D. TABLES

Each table should be typed on a separate sheet and should be Arabic numbered (Table 2). Each column requires a heading. Vertical lines should be avoided. Mention tables consecutively in the text and indicate approximate insertion points.

E. FIGURES

Figures should be submitted as glossy prints of the approximate size for final reproduction (ordinarily $4-4\frac{1}{2}$ inches in width). Lettering and lines should be sharp and clean. Figures should be Arabic numbered (Figure 2) in the text, and have consecutive mention and approximate insertion points. Each figure requires a legend, but all legends should be submitted double-spaced on a separate Figure Legends page.

1A
\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

May, 1974
Volume 87, First Half

Founded in 1935 by Carl Murchison

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

IRVIN L. CHILD
Yale University

LEONARD W. DOOB
Yale University

CHARLES K. FERGUSON
University of California,
Los Angeles

FRANK R. GELDARD
Princeton University

GEORGE M. GUTHRIE
Pennsylvania State
University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

If this space be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special
edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

DAVID HOTHERSALL
Ohio State University

DARWIN P. HUNT
New Mexico State
University

J. McV. HUNT
University of Illinois

JEROME KAGAN
Harvard University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

ARTHUR J. RIOPELLE
Louisiana State University

WARREN H. TEICHNER
New Mexico State
University

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass.
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02657

Microfiche Now Available

Back Issues

While continuing to maintain a complete inventory of paper-bound back issues for all five journals—some reprinted and some original editions—The Journal Press is now offering microfiche (negative silverfiche) versions for all but the last two calendar years: i.e., Volume 1 through 1970 volumes are available immediately; 1971 volumes will first be available in January 1974; 1972 volumes, in January 1975, etc. The minimum order is for one volume. The following rates are in effect: Paper-bound—single numbers, \$9.00; microfiche, not available. Paper-bound—two-part volumes, \$18.00; microfiche, \$6.00. Paper-bound—three-part volumes, \$27.00; microfiche, \$9.00. Paper-bound—four-part and over-four-part volumes, \$36.00; microfiche, \$12.00. The only exceptions (special issues) are starred below.*

VOLUMES	DATES	PRICE PER VOLUME		PRICE THROUGH 1970	
		PAPER	MICRO-FICHE	PAPER	MICRO-FICHE
<i>Journal of Genetic Psychology</i> (Pedagogical Seminary)					
1-117	1891-1970			\$2754.00	\$895.00
1-4	1891-April 1897	\$27.00	\$ 9.00		
5-37	July 1897-1930	36.00	12.00		
38*	1930	18.00	6.00		
39	1931	36.00	12.00		
40 and later	1932-	18.00	6.00		
<i>Genetic Psychology Monographs</i>					
1-82	1926-1970				
1-22	1926-1940			1872.00	620.00
23 and later	1941-	36.00	12.00		
		18.00	6.00		
<i>Journal of General Psychology</i>					
1-83	1928-1970				
1-3	1928-1930			1566.00	520.00
4*	1930	36.00	12.00		
5	1931	18.00	6.00		
6 and later	1932-	36.00	12.00		
		18.00	6.00		
<i>Journal of Social Psychology</i>					
1-82	1930-1970				
1-10	1930-1939			1656.00	550.00
11 and later	1940-	36.00	12.00		
		18.00	6.00		
<i>Journal of Psychology</i>					
1-76	1935/36-1970				
1 and later	1935/36-			1368.00	450.00
		18.00	6.00		

A mailing charge of \$0.30 per volume is made for foreign delivery of paper editions. Domestic paper mailings carry no postage charge. Prepaid foreign and domestic microfiche orders are also postage free; other orders will be billed for costs. Remittances should be by check or money order payable in U.S. funds on a United States bank, with no bank commission deducted. Advance payment is required from all individuals and from foreign purchasers. Microfilm versions and special bindings are not available. Microfiche orders only may be sent directly to The Journal Press or to Johnson Associates Inc., 175 Fifth Avenue, New York, New York 10010.

THE JOURNAL PRESS

2 Commercial Street

Provincetown, Massachusetts 02657

U. S. A.

Notice: All copyrighted material reprinted or otherwise reproduced from Journal Press publications should be given an appropriate acknowledgment. No permission is necessary for brief quotations and originally worded abstracts (less than 300-word total or 10 percent of length, whichever is least, for any one article). Written permission is required for reprinting or copying tables, figures, summaries, entire articles, or substantial portions thereof; such permission normally carries a charge of \$5 per page and is contingent upon agreement and possible stipulation of the original author or authors. Estate permission can be required. Authors requesting use of their own material are not charged. Fees may be waived for limited-copy instructional usage and for government periodicals. Special rates can be applied when justified.

The Journal of Psychology

Founded in 1935 by Carl Murchison

The Journal of Psychology was founded at the request of many psychologists throughout the world for the purpose of establishing a medium in which publication shall be immediate and in which other publication experiments may be carried out.

(1). The subscription price is \$39.00 per annum, \$18.00 per volume, \$9.00 per issue (three volumes per year).

(2). Manuscripts may be sent to any member of the Editorial Board or may be sent directly to The Journal Press. The lag in publication should not be more than a few weeks.

(3). The author will receive 200 reprints of his paper, and subscribers will receive the accumulated publications bound into half-volume units. The second half of each volume will contain the title page and table of contents for that volume. Each half-volume unit will be mailed to the subscribers at its stated date.

(4). Each author will be charged the manufacturing costs of any zincs, halftone cuts, tables, or equations. Excessive use of special fonts (references, footnotes, quotations, appendices) will also be charged.

(5). The publication charges are as follows:

1 to 4 pages	.....	\$60.00
5 to 8 "	.....	120.00
9 to 12 "	.....	180.00
13 to 16 "	.....	240.00
17 to 20 "	.....	300.00
21 to 24 "	.....	360.00
25 to 28 "	.....	420.00
29 to 32 "	.....	480.00

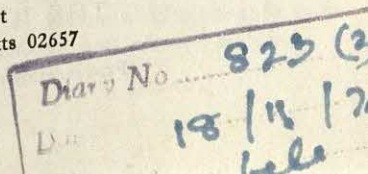
These charges are subject to adjustment as justified.

(6). The accumulated units will be mailed to subscribers bimonthly: January, March, May, July, September, and November. The units may vary in size to accommodate publication needs.

All back issues are available. See announcement on inside front cover.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.



Journal of Genetic Psychology

Founded by G. Stanley Hall in 1891; reorganized by Carl Murchison in 1925

Quarterly, beginning with March. Devoted to developmental and clinical psychology, with briefly reported Replications and Refinements and occasional book reviews. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of General Psychology

Founded in 1927 by E. B. Titchener and Carl Murchison

Quarterly, beginning with January. Devoted to experimental, physiological, and comparative psychology, with briefly reported Replications, Refinements, and Comments. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of Social Psychology

Founded in 1929 by John Dewey and Carl Murchison

Bimonthly, beginning with February. Devoted to studies of persons in group settings and of culture and personality; special attention to cross-cultural articles and notes, to field research, and to briefly reported Replications and Refinements. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Three volumes annually. Per annum, \$39.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Each author will receive 100 unbound reprints gratis. Additional reprints may be purchased at a nominal cost when the author returns page-proof.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Club Rate for Five International Psychological Journals

	PER ANNUM
THE JOURNAL OF GENETIC PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
GENETIC PSYCHOLOGY MONOGRAPHS (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF GENERAL PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF SOCIAL PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
THE JOURNAL OF PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
	TOTAL \$156.00

TEACHERS AND STUDENTS EDITION, *Restricted Sale* \$50.00

The *Teachers and Students Edition* is open to any individual psychologist, teacher, student, or physician but requires an agreement that the edition will not be offered for sale till after five years from publication and an agreement that the edition will not be substituted for an institutional subscription. Write for our Teachers and Students contract card.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Genetic Psychology Monographs

Founded in 1925 by Carl Murchison

Quarterly, beginning with February. Devoted to developmental and clinical psychology. Each number one or more complete researches. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

NOTICE. Effective immediately we offer prior publication for certain selected monographs. Charges will be based on the announced rates for The Journal of Psychology. Regular monographs will carry no page charge for the first 50 pages, but for all pages above 50 there will be a charge of \$10.00 per page. Manufacturing costs of any zincs, halftone cuts, tables, or equations will be charged to authors, as will excessive use of special fonts. Two hundred reprints of each monograph will be supplied free of charge.

The listing of monographs for 1926 through 1963 will be printed in the first half of each volume of all five journals. Monographs published after 1963 will be listed in the second half of each volume.

Genetic Psychology Monographs (continued)

VOLUME 1—1926

- Performance tests for children of pre-school age—R. STUTSMAN
 An experimental study of the eidetic type—H. KLÜVER
 4. A study of natio-racial mental differences—N. D. M. HIRSCH
 A psychological study of juvenile delinquency by group methods—J. W. BRIDGES AND K. M. B. BRIDGES
 The influence of puberty praecox upon mental growth—A. GESELL

VOLUME 2—1927

2. The mind of a gorilla—R. M. YERKES
 The role of eye-muscles and mouth-muscles in the expression of the emotions—K. DUNLAP
 Family similarities in mental-test abilities—R. R. WILLOUGHBY
 Coordination in the locomotion of infants—L. H. BURNSIDE
 The mind of a gorilla: Part II. Mental development—R. M. YERKES

VOLUME 3—January-June, 1928

- An experimental study of the olfactory sensitivity of the white rat—J. R. LIGGETT
 A photographic study of eye movements in reading formulae—M. A. TINKER
 An experimental study of the East Kentucky mountaineers—N. D. M. HIRSCH
 Responses of foetal guinea pigs prematurely delivered—G. T. AVERY
 Objective differentiation between three groups in education (teachers, research workers, and administrators)—M. B. JENSEN
 The effect of segregation on the sex behavior of the white rat as measured by the obstruction method—M. JENKINS

VOLUME 4—July-December, 1928

- Observation and training of fundamental habits in young children—E. A. BOTT, W. E. BLATZ, N. CHANT, AND H. BOTT
 3. Determination of a content of the course in literature of a suitable difficulty for junior and senior high school students—M. C. BURCH
 5. Methods for diagnosis and treatment of cases of reading disability—M. MONROE

VOLUME 5—January-June, 1929

- The relative effectiveness of lecture and individual reading as methods of college teaching—E. B. GREENE
 The age factor in animal learning: I. Rats in the problem box and the maze—C. P. STONE
 The effect of delayed incentive on the hunger drive in the white rat—E. L. HAMILTON
 Which hand is the eye of the blind?—J. M. SMITH
 The effect of attitude on free word association-time—A. G. EKDAHL
 The localization of tactual space: A study of average and constant errors under different types of localization—L. E. COLE
 The effects of gonadectomy, vasotomy, and injections of placental and orchic extracts on the sex behavior of the white rat—H. W. NISSEN

VOLUME 6—July-December, 1929

- Learning and growth in identical infant twins: An experimental study by the method of co-twin control—A. GESELL AND H. THOMPSON
 The age factor in animal learning: II. Rats on a multiple light discrimination box and a difficult maze—C. P. STONE
 The acquisition and interference of motor habits in young children—E. MCGINNIS
 A vocational and socio-educational survey of graduates and non-graduates of small high schools of New England—A. D. MUELLER
 6. A study of the smiling and laughing of infants in the first year of life—R. W. WASHBURN

VOLUME 7—January-June, 1930

- Tensions and emotional factors in reaction—E. DUFFY
 Teacher influence on class achievement: A study of the relationship of estimated teaching ability to pupil achievement in reading and arithmetic—H. R. TAYLOR
 4. A study of the effect of inverted retinal stimulation upon spatially coordinated behavior—P. H. EWERT
 A study of the mental development of children with lesion in the central nervous system—E. E. LORD
 An experimental study upon three hundred school children over a six-year period—N. D. M. HIRSCH

VOLUME 8—July-December, 1930

- The amount and nature of activities of newborn infants under constant external stimulating conditions during the first ten days of life—O. C. IRWIN
 Race and social differences in performance tests—S. D. PORTEUS, *et al.*
 Language and growth: The relative efficacy of early and deferred vocabulary training, studied by the method of co-twin control—L. C. STRAYER
 Eye-movements and optic nystagmus in early infancy—J. M. MCGINNIS
 6. Reactions of kindergarten, first-, and second-grade children to constructive play materials—L. FARWELL

VOLUME 9—January-June, 1931

2. The status of the first-born with special reference to intelligence—H. H. HSIAO
 4. An experimental study of bright, average, and dull children at the four-year mental level—H. P. DAVIDSON
 An historical, critical, and experimental study of the Seashore-Kwalwasser test battery—P. R. FARNSWORTH
 A comparison of difficulty and improvement in the learning of bright and dull children in reproducing a descriptive selection—F. T. WILSON
 VOLUME 10—July-December, 1931

- A comparative study of a group of southern white and negro infants—M. B. MCGRAW
 3. An experimental study of prehension in infants by means of systematic cinema records—H. M. HALVERSON
 The limits of learning ability in kittens—A. M. SHUEY
 6. The effect of habit interference upon performance in maze learning—O. W. ALM

VOLUME 11—January-June, 1932

- General factors in transfer of training in the white rat—T. A. JACKSON
 The effect of color on visual apprehension and perception—M. A. TINKER
 The reliability and validity of maze experiments with white rats—R. LEEPER
 A critical study of two lists of best books for children—F. K. SHUTTLEWORTH
 6. Measuring human energy cost in industry: A general guide to the literature—R. M. PAGE

VOLUME 12—July-December, 1932

- Family resemblances in verbal and numerical abilities—H. D. CARTER
 The development of fine prehension in infancy—B. M. CASTNER
 4. The growth of adaptive behavior in infants: An experimental study at seven age levels—H. M. RICHARDSON
 6. Differential reactions to taste and temperature stimuli in newborn infants—K. JENSEN

VOLUME 13—January-June, 1933

- A critique of sublimation in males: A study of forty superior single men—W. S. TAYLOR
 A study of the nature, measurement, and determination of hand preference—H. L. KOCH, *et al.*
 The growth and decline of intelligence: A study of a homogeneous group between the ages of ten and sixty—H. E. JONES AND H. S. CONRAD
 The relation between the complexity of the habit to be acquired and the form of the learning curve in young children—M. L. MATTHEWSON
 Eating habits in relation to personality development of two- and three-year-old children: A study of sixty-nine children in two nursery schools—A. A. ELIOT
 Coordinating mechanisms of the spinal cord—O. C. INGEBRITSEN

Genetic Psychology Monographs (continued)

VOLUME 14—July-December, 1933

1. Mental growth during the first three years: A developmental study of sixty-one children by repeated tests—N. BAYLE
2. A study of triplets: including theories of their possible genetic relationships—F. N. ANDERSON AND N. V. SCHEIDEMAN
3. The objective measurement of emotional reactions—H. V. GASKILL
4. Development of behavior in the fetal cat—J. D. CORONIOS
5. A study of certain language developments of children in grades four to twelve, inclusive—L. L. LABRANT
6. The effect of early and delayed practice on memory and motor performances studied by the method of co-twin control—J. R. HILGARD

VOLUME 15—January-June, 1934

1. Studies in the psychology of tone and music—P. R. FARNSWORTH
2. Motor learning of children in equilibrium in relation to nutrition—E. L. BEEBE
3. Discrimination limens of pattern and size in the goldfish *Carassius auratus*—J. B. ROWLEY
4. Limits of learning ability in the white rat and the guinea pig—B. F. RIESS
- 5 & 6. The limits of learning ability in rhesus monkeys—H. A. FIELD

VOLUME 16—July-December, 1934

1. A statistical study of ratings on the California Behavior Inventory for Nursery-School Children—H. S. CONRAD
2. An eye-movement study of objective examination questions—A. FRANSEN
3. An experimental study of constitutional types—O. KLINEBERG, S. E. ASCH, AND H. BLOCK
4. The development of a battery of objective group tests of manual laterality, with the results of their application to 1300 children—W. N. DUNOS
- 5 & 6. An experimental study in the prenatal guinea-pig of the origin and development of reflexes and patterns of behavior in relation to the stimulation of specific receptor areas during the period of active fetal life—L. CARMICHAEL

VOLUME 17—January-December, 1935

1. Organization of behavior in the albino rat—R. L. THORNDIKE
2. Brightness discrimination in the rhesus monkey—M. P. CRAWFORD
3. The limits of learning ability in cebus monkeys—A. M. KOCH
4. Nature-nurture and intelligence—A. M. LEAHY
5. On intelligence of epileptic children—E. B. SULLIVAN AND L. GAHAGAN
6. A study of the play of children of preschool age by an unobserved observer—D. L. COCKRELL

VOLUME 18—January-December, 1936

1. Sex differences in variational tendency—Q. MCNEAR AND L. M. TERMAN
2. The process of learning to dress among nursery-school children—C. B. KEY, M. R. WHITE, M. P. HONZIK, A. HEINRY, AND D. ERWIN
3. A study of the present social status of a group of adults, who, when they were in elementary schools, were classified as mentally deficient—W. R. BALLER
4. The influence of specific experience upon mental organizations—A. ANASTASI
- 5 & 6. Studies in aggressiveness—L. BENDER, S. KEISER, AND P. SCHILDER

VOLUME 19—January-December, 1937

1. Psychological bases of self-mutilation—C. DABROWSKI
- Masculine temperament and secondary sex characteristics: A study of the relationship between psychological and physical measures of masculinity—H. GILKINSON
2. A psychological study of forty unmarried mothers—R. D. NOTTINGHAM
3. Behavior problems in the children of psychotic and criminal parents—L. BENDER
4. Domination and integration in the social behavior of young children in an experimental play situation—H. H. ANDERSON
5. The sequential patterning of prone progression in the human infant—L. B. AMES

VOLUME 20—January-December, 1938

1. The relationship between characteristics of personality and physique in adolescents—P. S. DE Q. CABOT
2. Behavior problems of elementary school children: A descriptive and comparative study—I. Y. MASTEN
3. Graphic representation of a man by four-year-old children in nine prescribed drawing situations—P. F. GRIDLEY
4. Differences between two groups of adult criminals—R. S. TOLMAN
5. A comparative study by means of the Rorschach method of personality development in twenty pairs of identical twins—E. TROUP
6. Individual differences in the facial expressive behavior of preschool children: A study by the time-sampling method—C. SWAN

VOLUME 21—January-December, 1939

1. An experimental analysis of "level of aspiration"—R. GOULD
2. Some light on the problem of bilingualism as found from a study of the progress in mastery of English among preschool children of non-American ancestry in Hawaii—M. E. SMITH
3. Domination and social integration in the behavior of kindergarten children and teachers—H. H. ANDERSON
4. The capacity of the rhesus and cebus monkey and the gibbon to acquire differential response to complex visual stimuli—W. E. GALT
5. The social-sex development of children—E. H. CAMPBELL

VOLUME 22—January-December, 1940

1. Measuring human relations: An introduction to the study of the interaction of individuals—E. D. CHAPPLE
2. Aggressive behavior in young children and children's attitudes toward aggression—M. D. FITE
3. Student attitudes toward religion—E. NELSON
4. The prediction of the outcome-on-furlough of dementia praecox patients—J. S. JACOB
5. Significant characteristics of preschool children as located in the Conrad inventory—K. H. READ
6. Learning by children at noon-meal in a nursery school: Ten "good" eaters and ten "poor" eaters—J. B. MCCAY, E. W. WARRING, AND P. J. KRUSE

VOLUME 23—January-June, 1941

1. Studies in the interpretation of play: I. Clinical observation of play disruption in young children—E. H. ERIKSON
2. An analysis of certain variables in a developmental study of language—F. M. YOUNG
3. Infant development under conditions of restricted practice and of minimum social stimulation—W. DENNIS
4. An analysis of the mental factors of various age groups from nine to sixty—B. BALINSKY
5. Factors influencing performance on group and individual tests of intelligence: I. Rate of work—M. W. BENNETT
6. Individual differences in apperceptive reaction: A study of the response of preschool children to pictures—E. W. AM

VOLUME 24—July-December, 1941

1. Twins T and C from infancy to adolescence: A biogenetic study of individual differences by the method of co-twin control—A. GESELL AND H. THOMPSON
2. Finger nail-biting: Its incipency, incidence, and amelioration—A. L. BILLIC
3. An experimental study of the factors of maturation and practice in the behavioral development of the embryo of the frog, *Rana pipiens*—A. FROMME
4. The Feis child behavior scales—T. W. RICHARDS AND M. P. SIMONS
5. Measurement of the size of general English vocabulary through the elementary grades and high school—M. K. SMITH
6. Stereotypes in the field of musical eminence—P. R. FARNSWORTH

VOLUME 25—January-June, 1942

1. A study of factors determining family size in a selected professional group—J. C. FLANAGAN
2. A genetic study of geometrical-optical illusions—A. WALTERS
3. Interpretation of behavior-ratings in terms of favorable and unfavorable deviations: A study of scores from the Conrad Behavior Inventory—K. H. READ AND H. S. CONRAD
4. Are there any innate behavior tendencies?—J. B. SCHOELLAND
5. An investigation of the intelligibility of the speech of the deaf—C. V. HUDGINS AND F. C. NUMBERS

Genetic Psychology Monographs (continued)

VOLUME 26—July-December, 1942

- The critical frequency limit for visual flicker in children between the ages of 6 and 18—V. L. MILLER
Some factors determining handedness in the white rat—K. L. WENTWORTH
Motivation and behavior—E. FRENKEL-BRUNSWIK

VOLUME 27—January-June, 1943

- Comparison of children's personality traits, attitudes, and intelligence with parental occupation—N. R. MADDY
A comparative study of mental functioning patterns of problem and non-problem children seven, eight, and nine years of age—M. L. PIGNATELLI

VOLUME 28—July-December, 1943

- Separation anxiety in young children: A study of hospital cases—H. EDELSTON
Correlates of vocational preferences—W. A. BRADLEY, JR.

VOLUME 29—January-June, 1944

- Mental changes after bilateral prefrontal lobotomy—S. D. PORTEUS AND R. D. KEPNER
A twin-controlled experiment on the learning of auxiliary languages—B. PRICE, W. J. KOSTIR, AND W. M. TAYLOR

VOLUME 30—July-December, 1944

- A method of administering and evaluating the thematic appreciation test in group situations—R. M. CLARK
A study of anxiety reactions in young children by means of a projective technique—R. TEMPLE AND E. W. AMEN

VOLUME 31—January-June, 1945

- The evolution of intelligent behavior in rhesus monkeys—B. WEINSTEIN
Perceptual behavior of brain-injured, mentally defective children: An experimental study by means of the Rorschach technique—H. WERNER

VOLUME 32—July-December, 1945

- A clinical study of sentiments: I.—H. A. MURRAY AND C. D. MORGAN
A clinical study of sentiments: II.—H. A. MURRAY AND C. D. MORGAN

VOLUME 33—January-June, 1946

- Interpretation of spontaneous drawings and paintings—T. S. WAERNER
Preferences for sex symbols and their personality correlates—K. FRANCK
Outstanding traits: In a selected college group, with some reference to career interests and war records—F. L. WELLS AND W. L. WOODS

VOLUME 34—July-December, 1946

- The relation of emotional adjustment to intellectual function—J. L. DESPERT AND H. O. PIERCE
The smiling response: A contribution to the ontogenesis of social relations—R. A. SPITZ
Finger-painting and personality diagnosis—P. J. NAPOLI

VOLUME 35—January-June, 1947

- The thematic apperception technique in the study of culture-personality relations—W. E. HENRY
A continuation study of anxiety reactions in young children by means of a projective technique—M. DORKEY AND E. W. AMEN

- A study of the vocational interest trends of secondary school and college women—A. M. CAWLEY

VOLUME 36—July-December, 1947

- Maze test validation and psychosurgery—S. D. PORTEUS AND H. N. PETERS
The diagnostic implications of Rorschach's test in case studies of mental defectives—I. JOLLES

VOLUME 37—January-June, 1948

- The radio day time serial: A symbolic analysis—W. L. WARNER AND W. E. HENRY
The relation of personality characteristics and response to verbal approval in a learning task—G. L. GRACE
The mechanism of vision: XVIII. Effects of destroying the visual "associative areas" of the monkey—K. S. LASHLEY
A study of the relationship between handwriting and personality variables—P. CASTELNUOVA-TEDESCO

VOLUME 38—July-December, 1948

- Modern language learning: The intensive course as sponsored by the United States Army, and implications for the undergraduate course of study—M. LIND
Conflict: A study of some interactions between appetite and aversion in the white rat—M. A. TOLCOTT
Schizophrenia and the MAPS test: A study of certain formal psycho-social aspects of fantasy production in schizophrenia as revealed by performance on the Make a Picture Story (MAPS) Test—E. S. SHNEIDMAN
A study of the transmission of authority patterns in the family—H. L. INGERSOLL

VOLUME 39—January-June, 1949

- A study of the psychoanalytic theory of psychosexual development—G. S. BLUM
The assessment of parental attitudes in relation to child adjustment—E. J. SHOREN, JR.
Qualitative differences in the vocabulary responses of normals and abnormals—H. FEIFEL
The relative effectiveness of motion and still pictures as stimuli for eliciting fantasy stories about adolescent-parent relationships—P. E. EISERER
The organization of hereditary maze-brightness and maze-dullness—L. V. SEARLE

VOLUME 40—July-December, 1949

- An experimental study of what young school children expect from their teachers—B. BIBER AND C. LEWIS
A study of the relative effects of age and of test difficulty upon factor patterns—H. A. CURTIS
A projective experiment using incomplete stories with multiple choice endings—J. K. SEATON
Effects of sex role and social status on the early adolescent personality—E. MILNER
Social perceptions and attitudes of children—M. RADKE, H. TRAGER, AND H. DAVIS

VOLUME 41—January-June, 1950

- Some psychological and educational aspects of pediatric practice: A study of well-baby clinics—L. H. BLUM
One-trial learning in the domestic rat—B. B. HUDSON
An introduction to the principles of scientific psychoanalysis—A. ELLIS
Awareness of racial differences by preschool children in Hawaii—D. V. SPRINGER
Age trends in children's evaluation of teacher-approved and teacher-disapproved behavior—S. L. WITRYOL
The relationship between level of vocational aspiration and certain personal data: A study of some traits and influences bearing on the prestige level of vocational choice—J. STUBBINS

VOLUME 42—July-December, 1950

- Personality patterns of suicidal mental hospital patients—N. L. FARBEROW
Sex-role identification in young children in two diverse social groups—M. RABBAN
A study of the influence of the social field on individual behavior: As revealed in the expression of hostility and warmth by neurotics and paranoid schizophrenics in discussion group situations—D. SHAPIRO
An experimental study of avoidance—R. F. HEFFERLINE

VOLUME 43—January-June, 1951

- A study of copying ability in children—E. A. TOWNSEND
Prestige motivation of gifted children—D. P. AUSUBEL
A psychological study of physical scientists—A. ROE

VOLUME 44—July-December, 1951

- The organization of hostility controls in various personality structures—S. FISHER AND E. HINDS
Children and radio: A study of listeners and non-listeners to various types of radio programs in terms of selected ability, attitude, and behavior measures—E. A. RICCIUTI
Quantitative expression in young children—W. E. MARTIN
The use of magnetic devices in the collection and analysis of the preverbal utterances of an infant—A. W. LYNNE

VOLUME 45—January-June, 1952

- Japanese-American personality and acculturation—W. CAUBILL
A statistical study of the Freudian theory of levels of psychosexual development—C. A. BARNES
Personality characteristics of selected disability groups—D. N. WIENER

Genetic Psychology Monographs (continued)

VOLUME 46—July-December, 1952

1. The relationship of social status, intelligence, and sex of ten- and eleven-year-old children to an awareness of poverty—F. J. ESTVAN
An empirical study of the castration and Oedipus complexes—S. M. FRIEDMAN
2. The relationship between projective test scoring categories and activity preferences—M. M. SCHWARTZ
A comparison of formal and content factors in the diagnostic testing of schizophrenia—M. SHERMAN

VOLUME 47—January-June, 1953

1. Ability and accomplishment of persons earlier judged mentally deficient—D. C. CHARLES
Variations in the consistency of the behavioral meaning of personality test scores—M. KORNREICH
2. Some child-rearing antecedents of aggression and dependency in young children—R. R. SEARS, *et al.*
Symptom correlates for descriptive diagnosis—J. R. WITTENBORN, *et al.*

VOLUME 48—July-December, 1953

1. Age and mental abilities: A longitudinal study—W. A. OWENS, JR.
The development of a personality questionnaire for drinkers—P. J. HAMPTON
Personality and physical disease: A test of the Dunbar hypothesis applied to diabetes mellitus and rheumatic fever—D. H. CROWELL
2. Socio-economic contrasts in children's peer culture prestige values—B. POPE
A critical review of the stability of social acceptability scores obtained with the partial-rank-order and the pair comparison scales—S. A. WITRYOL AND G. G. THOMPSON
A study of the effects of color on Rorschach responses—G. G. BRODY

VOLUME 49—January-June, 1954

1. Factors underlying major reading disabilities at the college level—J. A. HOLMES
Parent behavior toward first and second children—J. K. LASKO
2. Social-status and intelligence: An experimental study of certain cultural determinants of measured intelligence—E. A. HAGGARD
Certain determinants and correlates of authoritarianism—S. SIEGEL
Personalities in faces: I. An experiment in social perceiving—P. F. SECORD, W. F. DUKES, AND W. BEVAN

VOLUME 50—July-December, 1954

1. A study of the relationship between play patterns and anxiety in young children—E. W. AMEN AND N. RENISON
Operational exploration of the conceptual self system and of the interaction between frames of reference—M. EDELS AND A. E. JONES
Problem solving: A statistical description of some relationships between organismic factors and selected response measures—N. A. FATTU, E. KAPOs, AND E. V. MECH
2. The relation of cortical potentials to perceptual functions—C. CHYATTE
The import for clinical psychology of the use of tests derived from theories about infantile sexuality and adult character—D. W. MILES
Measuring personality in developmental terms: The Personal Preference Scale—M. H. KROUT AND J. K. TABIN

VOLUME 51—January-June, 1955

1. Some relations between techniques of feeding and training during infancy and certain behavior in childhood—H. BERNSTEIN
The expression of personality in drawings and paintings—L. H. STEWART
2. Negative stereotypes concerning Americans among American-born children receiving various types of minority-group education—J. A. FISHMAN
The Lincoln-Oseretsky Motor Development Scale—W. SLOAN

VOLUME 52—July-December, 1955

1. Some personality correlates of sex, sibling position, and sex of sibling among five- and six-year-old children—H. KOCH
A quantitative Rorschach assessment of maladjustment and rigidity in acculturating Japanese Americans—G. DeVOS
Measurement of authoritarianism and its relation to teachers' classroom behavior—H. M. MCGEE
2. The formal aspects of schizophrenic verbal communication—B. MIRIN
A study in an aspect of concept formation, with subnormal, average, and superior adolescents—H. N. HOFFMAN
Traumatic avoidance learning: Acquisition and extinction in dogs deprived of normal peripheral autonomic function—L. C. WYNNE AND R. L. SOLOMON

VOLUME 53—January-June, 1956

1. As the psychiatric aide sees his work and problems—F. L. WELLS, M. GREENBLATT, AND R. W. HYDE
An investigation of avoidance, anxiety, and escape behavior in human subjects as measured by action potentials muscle—J. D. BROTHERS
Spread of effect: A critical review—M. H. MARX
2. Stress, fantasy, and schizophrenia: A study of the adaptive processes—O. J. B. KERNER
The attitude structure of the individual: A Q-study of the educational attitudes of professors and laymen—F. N. KERLINGER

VOLUME 54—July-December 1956

1. A study of personality differences between middle and lower class adolescents: The Szondi Test in culture-personality research—L. RAINWATER
The assessment of parental identification—S. W. GRAY AND R. KLAUS
2. The influence of social context on impulse and control tendencies in preadolescents—G. H. ZUK
Tender-mindedness versus tough-mindedness in psychology: A reexamination—H. WINTHROP
A method for the comparison of groups: A study in thematic apperception—L. C. SCHAW AND W. E. HENRY

VOLUME 55—January-June, 1957

1. Academic performance and personality adjustments of highly intelligent college students—B. M. HORRALL
The use of the Vineland Social Maturity Scale in the planning of an educational program for non-institutionalized low-grade mentally deficient children—M. G. GOTTSCHEN
2. The structure and origin of the anal character—H. BLOFF
Free expression of adolescents' interests—M. AMATORA
The rôle of mass media and the effect of aggressive film content upon children's aggressive responses and identification choices—R. S. ALBERT

Interest in persons as an aspect of sex difference in the early years—E. W. GOODENOUGH

VOLUME 56—July-December, 1957

1. Some stable response determinants of perception, thinking, and learning: A study based on the analysis of a single test—M. L. SIMMEL AND S. COUNTS
Potentials of age: An exploratory field study—S. L. PRESSEY
2. Tactile communication—L. K. FRANK
The use of a filmed puppet show as a group projective technique for children—M. R. HAWORTH
The social competence of middle-aged people—R. J. HAVIGHURST

VOLUME 57—January-June, 1958

1. Psychological and cultural problems in mental subnormality: A review of research—S. B. SARASON AND T. GLADWIN
2. Developmental aspects of discrimination in relation to adjustment—P. LONDON
Muscular tension as a response to psychological stress in rheumatoid arthritis and peptic ulcer—J. A. SOUTHWORTH
Frustration: Theory and experiment—R. LAWSON AND M. H. MARX

VOLUME 58—July-December, 1958

1. Emotional aspects of political behavior: The woman voter—E. M. BENNETT AND H. M. GOODWIN
The accuracy of self estimate: A measure of self-concept reality—R. M. BRANDT
Personality factors in social mobility: A study of occupationally mobile businessmen—J. C. ABEGGLEN
2. Interaction between authoritarian and nonauthoritarian principals and teachers—P. LAMBERT
Some factors related to the choice-status of ninety eighth-grade children in a school society—D. ELKINS
Some relationships between fantasy and self-report behavior—R. C. CALOGERAS

Genetic Psychology Monographs (continued)

VOLUME 59—January-June, 1959

- Freshman Rorschachs and college performance—G. R. SCHMEIDLER, M. J. NELSON, AND M. BRISTOL
 Perceptual aspects of attributed movement—R. W. COAN
 Men and women: Personality patterns and contrasts—E. M. BENNETT AND L. R. COHEN
 Personality factors in mothers of cerebral palsied children—G. BOLES
 Separatism and integrationism: A social-psychological analysis of editorial content in New York newspapers of three
 American minority groups—J. A. FISHMAN AND G. S. FISHMAN
 Self, role, and satisfaction—A. L. BROPHY

VOLUME 60—July-December, 1959

- The constancy of personality ratings over two decades—R. D. TUDENHAM
 Mother-son identification and vocational interest—L. H. STEWART
 A study of mother-child relationships in the emotional disorders of children—M. J. ROSENTHAL, M. FINKELSTEIN, E. NI, AND R. E. ROBERTSON
 On the trail of the wolf-children—W. F. OGBURN AND N. K. BOSE
 Measuring the mental health of normal adults—R. F. PECK
 Parental identification in young children—W. EMMERICH
 The problems of Jewish religious youth—B. M. LEVINSON

VOLUME 61—January-June, 1960

- Identifying socially maladjusted school children—A. A. ADAMS
 Social interaction in an interracial nursery school—H. W. STEVENSON AND N. G. STEVENSON, *et al.*
 Interests of pre-adolescent boys and girls—M. AMATORA
 Educational and sex differences in the organization of abilities in technical and academic students in Colombia, South America—J. F. FILELLA
 Some themes in the personalities of German men—L. RAINWATER
 Right-left gradients in body image, body reactivity, and perception—S. FISHER
 Longitudinal survey of child Rorschach responses: Younger subjects two to 10 years—L. B. AMES
 Personality patterns related to occupational roles—M. SIEGELMAN AND R. F. PECK

VOLUME 62—July-December, 1960

- The reading process: A descriptive, interdisciplinary approach—M. P. LANGMAN
 Reactions to stress as a function of the level of intelligence—S. M. H. ZAIDI
 Rorschach diagnosis by a systematic combining of content, thought process, and determinant scales—P. A. BOWER, R. TESTIN, AND A. ROBERTS
 Longitudinal survey of child Rorschach responses: Older subjects aged 10 to 16 years—L. B. AMES
 Twenty years of shock therapy in America, 1937-1956: An annotated bibliography—N. H. PRONKO, R. SITTERLY, AND K. BEAC
 The quantitative analysis of parent behavior toward psychotic children and their siblings—E. M. DONNELLY

VOLUME 63—January-June, 1961

- Make a sentence test: An approach to objective scoring of sentence completions—E. F. BORGATTA
 Some aspects of the relationship between perception and motility in children—E. P. ROTHMAN
 Some psychophysical aspects of mental illness in children—P. H. BERKOWITZ
 Conceptual thinking in schizophrenic children—G. FRIEDMAN
 Some maternal influences on children's personality and character—J. C. FINNEY
 A study of concept formation in normals, mental defectives, and brain-damaged adults—R. W. ZASLOW
 An investigation of trait relationships among six-year-old children—S. A. AVAKIAN

VOLUME 64—July-December, 1961

- Coping patterns of preschool children in response to intelligence test demands—A. MORIARTY
 Studies of individual and paired interactional problem-solving behavior of rats: II. Solitary and social controls—A. BARON AND R. A. LITTMAN
 Studies of role performance—J. H. MANN
 A psychological assessment of professional actors and related professions—R. TAFT
 A cross-cultural study of menstrual taboos—W. N. STEPHENS
 The biological roots of creativity—H. GUTMAN

VOLUME 65—January-June, 1962

- A Rorschach study of the development of personality structure in white and Negro children in a Southeastern community—A. C. PRICE
 Measuring personality patterns of women—J. LOEVINGER
 Home interests in early adolescence—M. AMATORA
 Social and emotional adjustment during adolescence as related to the development of psychosomatic illness in adulthood—L. H. STEWART
 A systematic study of interaction process scores, peer and self-assessments, personality and other variables—E. F. BORGATTA
 Children's conceptions of the content and functions of the human body—E. GELLERT

VOLUME 66—July-December, 1962

- Ocular-manual laterality and perceptual rotation of literal symbols—I. FLESCHER
 Parental child-rearing attitudes and their correlates in adolescent hostility—S. B. CHOROST
 Some explorations into the nature of anxieties relating to illness—P. R. ROBBINS
 Developmental-interactive aspects of hypnosis: Some illustrative cases—J. R. HILGARD AND E. R. HILGARD
 Teaching a two-year-old to read: An experiment in early childhood learning—W. FOWLER
 Achievement gains or losses during the academic year and over the summer vacation period: A study of trends in achievement by sex and grade level among students of average intelligence—K. M. PARSLEY, JR., AND M. POWELL

VOLUME 67—January-June, 1963

- Verbatim dialogue of a mother and child in therapy—C. E. MOUSTAKAS
 A study of self-concept: Delinquent boys' accuracy in selected self-evaluations—W. E. AMOS
 An integrating study of the factor structure of adult attitude-interests—R. B. CATTELL AND J. HORN
 Social factors in mental disorders: A contribution to the etiology of mental illness—W. C. COBLINER
 Conceptual preferences associated with choice of quantitative and nonquantitative college majors—J. GILBERT
 A study of the concept of the feminine role of 51 middle-class American families—A. STEINMANN

VOLUME 68—July-December, 1963

- Brain dynamism as reflected in illusions—G. K. YACORZYNSKI
 The nature and measurement of components of motivation—R. B. CATTELL, J. A. RADCLIFFE, AND A. B. SWENEY
 Sharing in preschool children as a function of amount and type of reinforcement—W. F. FISCHER
 The Gesell Incomplete Man Test as a measure of developmental status—L. B. AMES AND F. L. ILG
 Psychological and sociological factors in prediction of career patterns of women—M. C. MULVEY
 Functionalism and its historical significance—R. HARRISON

PUBLICATION IN THE JOURNAL OF PSYCHOLOGY

The Journal of Psychology provides a special service to authors and readers. Articles accepted for publication appear in print with the least possible delay. Although editorial standards are the same as those for the other journals, all correspondence and handling are expedited, and the referees may, at their discretion, permit some latitude in length of treatment with respect to tabular material, discussion, and review of the literature.

To save time, authors are requested to exercise unusual care in preparing their papers. Special attention should be paid to the General Instructions on the back cover of each issue and to the announcement on the first preliminary page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

May, 1974
Volume 87, First Half

(Founded in 1935 by Carl Murchison)

The Journal of PSYCHOLOGY

The General Field of Psychology

If this space should be unstamped, this is the regular library edition. But if this space is stamped with a designating title, this is a special edition, sold under the

restrictions of a bilateral contract, and may not be resold for a period of five years from the date of publication.

MAY 1974

(Manuscripts are printed in the order of final acceptance)

An environmental theory of job satisfaction	3
BY CHRISTOPHER ORPEN	
Emotional involvement and subjective distance: A modification of the inverse square root law	9
BY D. J. WALMSLEY	
Deviance, power, and the occult: A field study	21
BY FREDRICK J. SCHEIDT	
Effects of direct and indirect praise and blame on attribution	29
BY RABINDRA N. KANUNGO AND LEONARD NORMAN	
The relation of attention to social cue discrimination, achievement, and adjustment in the elementary school classroom	45
BY RICHARD M. LERNER, RICHARD J. RINI, AND HENRY ORLOFF	

(OVER)

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 0266

Race, competency, and level of achievement: Relationship to modeling in elementary school children	53
BY RAYMOND J. HAVELICK, JR., AND JULIA R. VANE	
The effects of the female-based family and birth order on the ability to self-disclose	59
BY E. LAMONTE OHLSON	
Adolescent-preadolescent differences in beliefs and attitudes about cigarette smoking	71
BY FRANK W. SCHNEIDER AND LORETTA A. VANMASTRIGT	
The effect of valence on performance in a conservation task	83
BY JOHN H. BERMUDEZ, DIRK C. PRATHER, GENE A. BERRY, AND ROBERT B. TEBBS	
Astrological indicators of personality	89
BY BERNIE I. SILVERMAN AND MARVIN WHITMER	
Summer job preferences	97
BY SHIRLEY A. EDWARDS AND MICHAEL W. MCCARREY	
The effect of interpersonal censure on the cognitive performance of acute process and reactive schizophrenic patients	103
BY PETER G. ALLEN	
Hostile verb use by youthful male prisoners with single vs. multiple offenses	107
BY HOYT MELVYN GILLEY AND DAVID CULLEN PERKINS	
Similarity, conditioned affect, and interpersonal attraction	111
BY RUSSELL G. GEEN AND DAVID STONNER	
Birth order, volunteering, and status of the experimenter: A negative note	119
BY PAUL A. ROODIN AND GLEN M. VAUGHT	
Psychological needs of suburban male heroin addicts	123
BY CHARLES SHEPPARD, ELIZABETH RICCA, JOHN FRACCHIA, AND SIDNEY MERLIS	
Body height, position, and sex as determinants of personal space	129
BY JOHN J. HARTNETT, KENT G. BAILEY, AND CRAIG S. HARTLEY	
Expressor sex, perceiver personality, and cognitive perception	137
BY BILL C. EDWARDS AND JETTIE M. MCWILLIAMS	
Perceptions of college students concerning alternate life styles	143
BY MAXINE EDWARDS AND NICK STINNETT	

AN ENVIRONMENTAL THEORY OF JOB SATISFACTION*

University of Cape Town, South Africa

CHRISTOPHER ORPEN

SUMMARY

It was proposed that content factors in the work situation are more important determinants of overall job satisfaction than context factors in work environments that provide adequately for the fulfilment of one's major needs, but that context factors are more important in environments that do not. To test this proposal, three groups of black South African factory workers at different organizational levels (supervisors, machine-minders, and cleaners) were given (a) the Porter need-fulfilment questionnaire, (b) the Brayfield-Rothe index of job satisfaction, and (c) a scale to measure their satisfaction with four content and four context factors. The fact that, among the high-fulfilment supervisors, satisfaction with the content factors was more highly related to overall job satisfaction than satisfaction with the context factors, but that the position was reversed among the low-fulfilment cleaners, was taken as support for the proposal.

A. INTRODUCTION

The motivation-hygiene theory of job satisfaction (3) has had a considerable impact on industrial psychology. However, despite the impressive number of studies aimed at testing the main predictions from the theory, there is still disagreement between those who feel that the theory is not supported by the data (4) and those who feel that the theory can account for the existing data (8). This disagreement stems from the fact that, of the only two consistent findings to emerge from these studies, one supports the motivation-hygiene theory in its original formulation, and one does not. The finding that supports the theory is that, on the whole, content elements in the work situation (intrinsic factors like achievement, task responsibility, advancement, and nature-of-work) are more powerful determinants of job satisfaction than context elements (extrinsic factors like working conditions, relations with supervisors, company policy, and relations with peers). The finding that does not support the theory is that, on the whole, the same

* Received in the Editorial Office on December 19, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

elements in the work situation are related to both job satisfaction and dissatisfaction. What is clearly needed is some more general theory that can account for both these sets of findings.

The environmental theory, as proposed by Soliman (7), which is derived fairly directly from Maslow's "need hierarchy" model of human motivation (5), appears to satisfy this requirement. According to this view, job satisfaction and dissatisfaction are opposite ends of the same continuum, and the same elements in the work situation can be related to both. Whether a given element is more highly related to job satisfaction or job dissatisfaction depends on the general work environment, which is conceptualized as a continuum ranging from highly non-need-satisfying (where it does not provide adequately for one's major needs) to highly need-satisfying (where it provides maximally for one's major needs). In terms of the "need hierarchy" model, persons in the former environment are unlikely to have these lower-level needs fulfilled, whereas persons in the latter environment are likely to have both their lower-level and higher-level needs fulfilled. It is argued from this that persons in a non-need-satisfying environment will obtain job satisfaction and dissatisfaction mainly from fluctuations in the degree of gratification of their lower-order needs, which are maximally responsive to context elements in the work situation, whereas persons in the need-satisfying environment will obtain job satisfaction and dissatisfaction mainly from fluctuations in the degree of gratification of their upper-order needs, which are maximally responsive to content elements in the work situation.

Since the gratification of one's lower-order needs (physiological, safety, and security needs) are pretty well guaranteed by Western society, this environmental view suggests that in this setting motivator factors, which are maximally responsive to content elements in the work situation, should be the major contributors to job satisfaction and dissatisfaction. It also suggests that, depending on the degree to which the work environment is need-satisfying, the same elements in the work situation can contribute to either job satisfaction or job dissatisfaction. In other words, the environmental view, as proposed by Soliman (7), can account for both the consistent findings mentioned earlier.

Despite this positive feature, the environmental theory has not yet been tested empirically. The only previous study to examine the theory (7) was inadequate, since it did not employ independent measures of the need-satisfying dimension of the work environment. The present study was designed to test three central predictions from the environmental theory of job satisfaction:

1. In a need-satisfying environment, content factors are more highly related to job satisfaction-dissatisfaction than context factors.
2. In a neutral environment, content and context factors are equally related to job satisfaction-dissatisfaction.
3. In a non-need-satisfying environment, context factors are more highly related to job satisfaction-dissatisfaction than content factors.

B. METHOD

1. *Subjects*

The subjects consisted of three groups of African factory workers in South Africa. The first group (A) consisted of 56 supervisors, who were each responsible for at least 10 machine operators and factory cleaners. None of them performed manual work of any kind, having been promoted at least six months earlier from manual positions to their current positions of greater power and responsibility. Their mean age was 36.4 ($SD = 7.2$), and their mean number of years at school 9.6 ($SD = 1.8$). The second group (B) consisted of 47 machine-minders, who were each responsible for the operating and routine repairing of machines involved in the making of auto components. Their mean age was 38.2 ($SD = 5.9$), and their mean number of years at school 7.4 ($SD = 1.3$). The third group (C) consisted of 51 cleaners who were each responsible for the sweeping of floors and the routine cleaning of machines. Their mean age was 35.4 ($SD = 6.1$), and their mean number of years at school 5.4 ($SD = 1.5$).

2. *Procedure*

To assess the degree to which the respective environments of these three groups were perceived to be need-satisfying, the subjects were each given the 13-item Porter questionnaire (6) in written form. The format and instructions were the same as in his original study, except that the word "management" was replaced by the word "job." Each subject was asked to indicate how much of a given characteristic is attached to his job and how much should be attached to his job. Following Porter (6), level of need fulfillment was given by the inverse of the difference between these "is now" and "should be" responses.

To assess the degree to which content and context factors contributed to job satisfaction-dissatisfaction, the subjects' responses to the four content (motivator) and four context (hygiene) job aspects, as assessed by the Halpern (2) job factor questionnaire, were correlated with their responses to the Brayfield-Rothe (1) index of job satisfaction. In the Halpern ques-

tionnaire, subjects indicated their amount of satisfaction with each of the content factors (achievement, advancement, nature of work, and responsibility) and each of the context factors (company policy, working conditions, relations with superiors, and relations with co-workers) on a series of six-point rating scales, ranging from 6 (extremely satisfied) to 1 (extremely dissatisfied). In the Brayfield-Rothe index the subjects responded along five-point scales to 18 job-related items to yield an overall score, indicating their level of general satisfaction with their job. The questionnaires were administered by a fellow African factory worker to the subjects, under anonymous conditions, during lunch-breaks.

C. RESULTS

At the outset it should be pointed out that the results of the present study may, perhaps, not be directly comparable to those done in the United States, in view of the fact that the present study used a sample drawn from a disadvantaged minority group (South African blacks), whereas those done in the United States used samples drawn from a nondisadvantaged majority group (American whites). As expected, group A perceived their work environment as relatively "high" in need-satisfaction, group B as fairly "neutral" in need-satisfaction, and group C as fairly "low" in need-satisfaction. For instance, the mean need-deficiency score on the Porter questionnaire obtained by the African cleaners ($M = 51.2$, $SD = 5.1$) was significantly greater ($p < .01$) than that obtained by the African machine-minders ($M = 35.6$, $SD = 6.3$), whose mean score, in turn, was significantly greater ($p < .01$) than that obtained by the African supervisors ($M = 28.9$, $SD = 4.8$). The general level of job satisfaction expressed by the three groups was in the same direction; for instance, the mean satisfaction score on the Brayfield-Rothe index of the supervisors ($M = 76.5$, $SD = 8.4$) was significantly greater ($p < .01$) than that of the machine-minders ($M = 66.3$, $SD = 11.3$) whose mean score, in turn, was significantly greater ($p < .01$) than that of the cleaners ($M = 50.1$, $SD = 9.4$).

In each of the three groups there was a positive relationship between perceived need-fulfillment and rated job satisfaction, indicating that the less deficient the subjects felt their work environment was in gratifying their major needs, the more satisfied they were with their jobs. For instance, in the supervisor group the correlation between need deficiency and overall job satisfaction was significantly negative ($r = -.28$, $p < .05$) as it was in the machine-minders group ($r = -.44$, $p < .01$) and in the cleaners group ($r = -.38$, $p < .01$).

The main predictions from the environmental view were confirmed. It was found, for instance, that content factors were more highly related to job satisfaction than context factors among the supervisors, that content and context factors were equally highly related to job satisfaction among the machine-minders, and that context factors were more highly related to job satisfaction than content factors among the cleaners. For instance, in the first case, the mean of the correlations between satisfaction with the four content factors and overall job satisfaction ($r = .68$) was significantly higher ($p < .05$) than that between satisfaction with the four context factors and overall job satisfaction ($r = .42$) in the group of African supervisors, whose mean score on the Porter need-fulfillment questionnaire suggests that these individuals, on the whole, find their work environment fairly high in need-fulfillment. In the second case, the mean of the correlations between satisfaction with the four content factors and overall job satisfaction ($r = .53$) was not significantly different ($p > .05$) from that between satisfaction with the four context factors and overall job satisfaction ($r = .49$) in the group of African machine-minders, whose mean score on the Porter need-fulfillment questionnaire suggests that these individuals, on the whole, find their work environment fairly neutral in need-fulfillment. In the third case, the mean of the correlations between satisfaction with the four content factors and overall job satisfaction ($r = .23$) was significantly lower ($p < .05$) than that between satisfaction with the four context factors and overall job satisfaction ($r = .46$) in the group of African cleaners, whose mean score on the Porter need-fulfillment questionnaire suggests that these individuals on the whole find their work environment fairly low in need-fulfillment.

In short, these results indicate that in a need-satisfying work environment, content factors are more important determinants of job satisfaction than context factors, but that in a non-need-satisfying work environment the position is reversed, with context factors being more important determinants of job satisfaction than content factors. They establish clearly that whether content or context factors are more important contributors of feelings of job satisfaction depends, to a large extent, on the nature of the work environment, especially the degree to which it is perceived as gratifying one's major needs. Moreover, they suggest that the motivation-hygiene theory of job satisfaction is only really applicable in the special case where the work environment is seen as producing a fairly high degree of need-fulfillment. What is needed now is a more general theory of job satisfaction, which shows how the work environment interacts with the individual's

frame of reference to produce feelings of satisfaction about the job. The present study highlights the need to consider explicitly the "extent to which the work environment is seen as need-satisfying" in any such general theory of job satisfaction.

REFERENCES

1. BRAYFIELD, A., & ROTHE, H. An index of job satisfaction. *J. Appl. Psychol.*, 1951, 35, 307-311.
2. HALPERN, G. Relative contributions of motivator and hygiene factors to overall job satisfaction. *J. Appl. Psychol.*, 1966, 50, 198-200.
3. HERZBERG, F., MAUSNER, B., & SNYDERMAN, B. *The Motivation To Work*. New York: Wiley, 1959.
4. HOUSE, R. J., & WIGDOR, L. A. Herzberg's dual-factor theory of job satisfaction and motivation: A review of the evidence and a criticism. *Person. Psychol.*, 1967, 20, 369-390.
5. MASLOW, A. H. *Motivation and Personality*. New York: Harper, 1954.
6. PORTER, L. W. A study of perceived need satisfaction in bottom and middle management jobs. *J. Appl. Psychol.*, 1961, 45, 1-10.
7. SOLIMAN, H. Motivation-hygiene theory of job satisfaction: An empirical investigation and an attempt to reconcile both the one- and two-factor theories of job attitudes. *J. Appl. Psychol.*, 1970, 54, 452-461.
8. WHITSETT, D. A., & WINSLOW, E. K. An analysis of studies critical of the motivator-hygiene theory. *Person. Psychol.*, 1967, 20, 391-416.

Department of Psychology
University of Cape Town
Rondebosch, South Africa

EMOTIONAL INVOLVEMENT AND SUBJECTIVE DISTANCE: A MODIFICATION OF THE INVERSE SQUARE ROOT LAW*

The University of New England, Australia

D. J. WALMSLEY

SUMMARY

The purpose of this study was to examine the universality of the "inverse square root law" insofar as it purports to show a constant relationship between emotional involvement and subjectively perceived geographical distance. It was argued that the square root exponent in the "law" was derived from experiments that used a limited range of stimuli (place names). With students as subjects, two experiments were conducted in order to discover the relationship between emotional involvement and subjective distance when both very close and very distant places were considered. It was shown that the inverse square root function was not constant but rather varied with the range of stimuli.

A. INTRODUCTION

Some years ago at the Psychological Laboratories of the University of Stockholm, Ekman and Bratfisch (6) pioneered work that investigated the relationship between emotional involvement and "subjectively perceived geographical distance." These studies were based on the observation that one is much less interested in what happens at a great distance than in what happens close by, and the work resulted in the conclusion that, if other factors were held constant, the relationship between emotional involvement (EI) and subjective distance (SD) formed an *inverse square root law* such that

$$EI = \frac{b}{\sqrt{SD}} \quad [1]$$

where the value of b is determined by the arbitrary units of measurement. The present study re-examined this research and attempted to show that the "law" has application only to a limited range of stimuli adopted in

* Received in the Editorial Office on December 19, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

Ekman and Bratfisch's original work and in several subsequent replications. As such the study is indicative of the type of research being undertaken in the emerging discipline of "behavioral geography" where emphasis is on the explanation of "spatial" behavior in terms of such processes as search, learning, and perception. For several years, geographers have been interested in how man perceives his environment, but only recently has attention shifted from a preoccupation with images to a concentration on spatial metrics, "mental maps," and subjective distance.

B. METHOD

1. *The Ekman-Bratfisch Experiment*

Ekman and Bratfisch used 46 subjects—all students—who were instructed to estimate 10 intercity distances with Stockholm as the center and to assess the emotional involvement they had with each city. The *complete ratio estimation method* was used whereby Ss were presented with pairs of cities and asked to judge which city lay at the greater subjective distance from Stockholm (or with which city they had the greater emotional involvement). The subjects were then required to assess the smaller subjective distance (or emotional involvement) as a percentage of the greater. Students were told to base estimates on immediate, unsophisticated impressions and were presented with an answer sheet on which all possible pairs appeared twice. The order of the stimuli (pairs of cities) was randomized, and all estimates were obtained in a single session. In order to gain some measure of the *importance* of the cities, Ekman and Bratfisch conducted a separate experiment with different Ss and used the method of *magnitude estimation* in that the scale value of 10 was assigned to Cape Town and the importance of the cities in the experiment was estimated in relation to this standard.

Two scales were devised from the estimates for each *condition* (subjective distance and emotional involvement). The manner in which the scales were constructed was comparatively simple. The median of each ratio estimate was calculated and included in one of two matrices that compared the 10 cities in terms of subjective distance and emotional involvement. From these matrices scales were constructed in the manner devised by Ekman (5, 8); that is,

$$R_i = (\Sigma r_i / \Sigma c_i)^{1/2} \quad [2]$$

where R_i is the scale value of city i and r_i and c_i are the sums of the i^{th} row and column, respectively. Ekman and Bratfisch subsequently standardized all scales to a base of 1.00.

The results of the early experiment were concerned with both the relationship between subjective and objective distance (for which the authors introduced the term "psychophysical function") and the distance/involvement curve. The present research restricted attention to the second of these because the former does not relate to the inverse square root law, and is, in any event, the subject of a separate investigation currently being undertaken. After their experiment, Ekman and Bratfisch interviewed the Ss and found that three factors influenced their estimates of both subjective distance and emotional involvement: the importance of the cities, the interest in the cities, and the degree of knowledge about the cities. Indeed, the first of these factors had a very pronounced effect on the results of the experiment insofar as two distinct curves could be identified. Curve *A* represented London, Moscow, and Paris, while curve *B* encompassed Budapest, Copenhagen, Hamburg, Kiruna, Montreal, Reykjavik, and Vienna. The fact that the curve *A* cities are important international centers led Ekman and Bratfisch (6, p. 432) to postulate that "politically and otherwise highly important centers attract an emotional involvement *additional* to that related to subjective distance." Moreover, they found that the difference between the curves could be represented by a constant *a* such that $(A-a)$ approximated *B* and that the exponent value for the slope of the regression line fitted to logarithmically transformed data was $-.50$.

There were two interesting theoretical problems that arose from this conclusion, the first of which related to the fact that as emotional involvement approached infinity, subjective distance approached zero. It was unclear, however, what comprised zero subjective distance, although operational definitions could be found in personal space. Ekman and Bratfisch suggested in fact that this problem could be avoided if a small constant was added to the denominator in equation 1. The second problem arose because the inverse square root law postulated that as emotional involvement approached zero, subjective distance approached infinity, and although this was intuitively appealing, there remained the problem of operational definition.

Despite these problems, Ekman and Bratfisch's finding was an important one, and several researchers realized that if further work substantiated the relatively simple relationship between emotional involvement and subjective distance, then the "law" would represent an important step in the quantification of social phenomena (12, p. 165). Accordingly, there have been a number of attempts to replicate the original experiment (1, 2, 4). In all cases university and high school students have been used, although the scaling procedures have varied from magnitude and complete ratio estimation on the one hand

to free ratio estimation on the other (11). Attempts have even been made to test the inverse square root law in relation to the temporal distance to historical time periods and persons (3) and to the anticipation of future events (7, 9). A good review of much of the research in this field has been provided by Lundberg, Bratfisch, and Ekman who concluded (10, p. 170) that the inverse square root law appeared to obtain in cross-national studies and in experiments that use different estimation techniques.

TABLE 1
THE RANGE OF THE STIMULI

Experiment	Median distance of cities from epicenter (km)
Bratfisch 1 (1)	1502
Bratfisch 2 (1)	1393
Bratfisch 3 (1)	1543
Bratfisch and Lundberg 1 (2)	853
Bratfisch and Lundberg 2 (2)	1320
Bratfisch and Lundberg 3 (2)	5652
Dornic (4)	1340
Ekman and Bratfisch (6)	1291
Walmsley I	10513
Walmsley IIa	22
Walmsley IIb	515
Walmsley IIc	4700

Note: All distances are great circle routes except those in Walmsley IIa and IIb which are road distances.

It remained true, however, that the exponent for the slope of the regression line was not absolutely invariant and that values between $-.46$ [Bratfisch and Lundberg (2)] and $-.53$ [Bratfisch (1) and Bratfisch and Lundberg (2)] were recorded. Furthermore, the range (in distance) of stimuli considered in both the original experiment and in subsequent replications was strangely limited (see Table 1), and incongruent findings (12, 13) were dismissed all too easily on rather trivial methodological grounds. Indeed, some of the results in support of the inverse square root law demonstrated a considerable degree of data manipulation to the extent that apparently complex scattergrams were differentiated into up to three curves (e. g., 1, p. 235). As a result of these shortcomings, an exercise was conducted (Experiment I) with students from the University of New England (Armidale, Australia) in which Ss were presented with a range of stimuli (cities) that included both nearby and distant centers.

2. Experiment I

Experiment I was conducted at a University of New England residential field school in Sydney and served to introduce students to psychological

scaling techniques prior to the commencement of a number of studies concerned with mental maps and distance distortion. The experiment was, however, explained to students *after* ratio estimates had been obtained so that there was no possibility of bias in the results. Moreover, the students were unfamiliar with scaling techniques. The experiment was adjudged to be *exploratory*, since its principal purpose was to see if a range of stimuli that included both distant and nearby cities provided an exponent value other than $-.50$.

As far as possible the experiment was a replication of the work of Ekman and Bratfisch insofar as all estimates were produced in a single session, Ss were provided with answer sheets, and scales were generated by means of the complete ratio estimation method. One slight difference resulted from the fact that although all possible pairs of cities were presented, each pair appeared only once. However, in order to avoid bias, the selection of the first-named city in each pair was randomized as was the order in which pairs appeared. In all, 39 Ss estimated emotional involvement and subjective distance for 10 cities with Sydney as the epicenter. In addition, a measure of the importance of each city was obtained by asking Ss to assess this relative to a standard score of 10 for Cape Town. In this way it was hoped that very important centers could be omitted from the original group of 10 so as to avoid the subjective practice of identifying two or more distinct curves (*cf.* 1).

Although no time limit was imposed, some students failed to complete the exercise, and subsequent interviews indicated that many Ss were *uncertain* about their answers. Table 2 shows the percentage of respondents who were able to estimate subjective distance to within 10 percent of straight-line distance, and the low degree of accuracy suggests that the *median* (used by Ekman and Bratfisch) may not be the most meaningful index of the centrality of the estimates. As a result, it was decided to calculate scale values based on the *modal response* as well as the median and, accordingly, the range of estimates was divided into five percent intervals. The fact that pairs of cities were presented only once meant that medians and modes were easily calculated. From the matrices thus obtained, the scales were constructed in accordance with equation 2.

The regression lines plotted to the logarithmically transformed median and mode scale values for the original 10 cities proved to be insignificant (equations 3 and 4) and not dissimilar from the result produced by Stanley (12) at the University of New England some years earlier.

TABLE 2
THE RESULTS OF EXPERIMENTS I AND II

Center	Approximate distance (km)	Median EI	SD	Median EI	Mode SD	Importance	% Ss within $\pm 10\%$ objective distance
Experiment I							
Auckland	2002	1.95	1.00	2.26	1.00	6.0	53
Bangkok	7657	1.41	2.32	1.49	2.49	6.0	44
Beirut	14322	1.00	3.76	1.00	4.03	6.0	39
Cape Town	11157	1.41	3.59	1.87	3.71	7.0	32
Chicago	14899	1.59	4.57	1.91	4.83	10.0	37
Delhi	10513	1.73	3.00	2.04	3.11	8.0	38
Moscow	14603	na	na	na	na	16.0	na
Paris	17165	na	na	na	na	13.0	na
Peking	8958	na	na	na	na	15.0	na
Singapore	6316	2.32	2.05	3.45	2.26	11.0	41
Experiment IIa							
Bendemeer	63	na	na	na	na	na	na
Blue Hole	16	2.48	1.00	9.09	1.00	na	25
Dangars Falls	19	1.80	1.14	3.03	1.32	na	12
Guyra	34	na	na	na	na	na	na
Hillgrove	24	1.39	1.49	2.49	1.78	na	18
Uralla	31	1.00	1.48	2.60	1.11	na	13
Rockvale	20	1.95	1.18	3.29	1.22	na	27
Walcha	53	na	na	na	na	na	na
Wollomombi	37	na	na	na	na	na	na
Yarrowyck	29	1.00	1.62	1.00	1.67	na	13

TABLE 2 (Continued)

Center	Approximate distance (km)	EI	Median SD	EI	Mode SD	Importance	% Ss within $\pm 10\%$ objective distance
Experiment IIb							32
Bega	700	1.29	3.62	1.68	4.24	5.0	22
Bourke	556	1.32	3.10	1.25	3.49	5.5	na
Cooma	680	na	na	na	na	3.5	26
Coonabarabran	242	1.81	1.74	1.84	2.00	5.0	23
Deniliquin	839	1.00	3.74	1.00	4.43	6.0	23
Forbes	474	1.36	2.55	1.84	2.92	8.0	40
Glen Innes	88	2.16	1.00	3.79	1.00	7.0	22
Gundagai	613	1.43	2.95	1.68	3.54	5.0	23
Moree	216	1.49	1.67	2.43	1.73	6.0	na
Walgett	350	na	na	na	na	3.5	
Experiment IIc							20
Auckland	2002	2.02	1.04	2.77	1.00	20.0	24
Bangkok	7657	1.65	1.99	2.08	2.47	31.0	20
Bougainville	3084	1.53	1.09	2.04	1.33	10.0	18
Dunedin	2164	1.55	1.20	1.81	1.40	11.5	21
Kuala Lumpur	6678	1.69	1.71	2.60	2.07	30.0	16
Noumea	2020	1.95	1.09	2.71	1.32	10.0	16
Phnom Penh	7134	1.47	2.11	1.50	2.50	27.0	19
Port Moresby	2736	1.79	1.00	2.65	1.23	12.0	12
Singapore	6316	1.69	1.57	2.33	1.73	40.0	16
Taipei	7268	1.00	2.17	1.00	2.47	23.0	

Note: EI represents emotional involvement, and SD subjective distance; na means not applicable.

Median: $\text{Log EI} = .15 + .13 \log \text{SD}; r = +.19; n = 10$ [3]

Mode: $\text{Log EI} = .23 + .01 \log \text{SD}; r = +.01; n = 10$ [4]

An examination of the importance of each city (Table 2) revealed, however, that three centers (Paris, Peking, and Moscow) were considerably more important than the others, and when these were omitted and the scales recalculated on the basis of seven cities (equations 5 and 6), the results proved to be more in line with what was expected, although exponent values for the slope of the regression lines were still well below $-.50$.

Median: $\text{Log EI} = .32 - .30 \log \text{SD}; r = -.57; n = 7$ [5]

Mode: $\text{Log EI} = .41 - .31 \log \text{SD}; r = -.43; n = 7$ [6]

3. *Experiment II*

There was no reason to believe that the exponent values produced in equations 5 and 6 were in any way spurious, since each scale (with seven cities and 39 Ss) was based on 819 estimates. As a result, a general hypothesis was formulated to the effect that the physical range of the stimuli (in terms of distance) influences the magnitude of the exponent in the relationship between emotional involvement and subjective distance. The rationale for this hypothesis was twofold: on the one hand a range of widely separated cities produced a low exponent (Experiment I), and on the other hand the replications that corroborate the Ekman-Bratfisch result ignored cities located at both very short and very great distances from the epicenter of the experiment. It was decided, therefore, to undertake a second exercise (Experiment II) so as to calculate exponent values for centers at varying distances from Armidale (the location of the University of New England). Three particular experiments (IIa, IIb, IIc) were conducted. The first (IIa) concentrated on local centers around the University of New England, the second (IIb) involved New South Wales country towns, and the third (IIc) was based on cities in southeast Asia. Specifically, it was postulated that the exponent values would be reduced as the distance scale of the stimuli increased or, in operational terms, that exponents could be arranged in the following transitive manner: Experiment IIa > Experiment IIb > Experiment IIc > Experiment I.

In order to select a range of 10 cities of reasonably similar importance for Experiments IIb and IIc, it was resolved to present a list of 24 New South Wales and 19 southeast Asian cities to 15 colleagues in the Department of Geography at the University of New England. The free ratio estimation

method was adopted, and respondents were asked to score the importance of each city relative to a score of 10 for a "standard" city on each list. Unfortunately, this procedure was impractical for Experiment IIa, since there were only 10 "local" centers that could be used. Median values provided the appropriate measures of importance.

As far as possible Experiment II was a replication of Experiment I. Ss were second and third year undergraduates at the University of New England of whom only a negligible proportion had had previous experience with psychological scaling techniques. There were 25 Ss in Experiment IIa, 26 in Experiment IIb, and 27 in Experiment IIc. Again the complete ratio estimation method was used, and each pair of cities was presented once and in a randomized order. The only difference between Experiments I and II was the fact that in the latter case a time limit of 30 minutes was imposed. Students were instructed to work steadily and to omit questions to which the only answer would have been a complete guess. Table 2 shows the relative accuracy of the estimates for each city, and the low figures add support to the arguments for using scales based on both the mode and the median of the range of responses.

Discussion with Ss after the experiment revealed that although the southeast Asian cities were interpreted as a homogeneous group, this was not the case with either the local centers or the New South Wales towns (despite the preselection process in the latter case). Specifically, it was argued that in Experiment IIa the centers of Guyra, Bendemeer, Wollomombi, and Walcha differed from the others in that they were located at much *greater distances* from Armidale. Similarly, in Experiment IIb the towns of Walgett and Cooma were thought by many Ss to be *less important* than the remaining towns. In view of the fact that both these claims were well-founded (Table 2), it was decided to omit these six centers from the original 30 in Experiment II. This meant that each scale in Experiment IIa was based on 375 estimates, while Experiments IIb and IIc were based on 728 and 1215 experiments, respectively. Admittedly, such a procedure was a little arbitrary, but it was contended that this practice was more satisfactory than the subjective identification of several curves in that the decision was made *prior* to scale construction and not as a *post hoc* rationalization.

C. RESULTS

The results of fitting regression lines to the relationships between emotional involvement and subjective distance are presented below. It can be seen from the six equations that the exponent value varies greatly. Further-

more, the correlation coefficients are relatively high, and, with the exception of Experiment IIa, there is little difference in the magnitude of the correlation between scales based on the median and those based on the mode. It is significant that the higher exponent values occur consistently in scales based upon the mode.

1. *Experiment IIa (Local)*

Median: $\log EI = .40 - 1.89 \log SD$; $r = -.95$; $n = 6$ [7]

Mode: $\log EI = .75 - 2.40 \log SD$; $r = -.76$; $n = 6$ [8]

2. *Experiment IIb (New South Wales)*

Median: $\log EI = .32 - .45 \log SD$; $r = -.90$; $n = 8$ [9]

Mode: $\log EI = .55 - .71 \log SD$; $r = -.89$; $n = 8$ [10]

3. *Experiment IIc (Southeast Asia)*

Median: $\log EI = .27 - .40 \log SD$; $r = -.63$; $n = 10$ [11]

Mode: $\log EI = .45 - .60 \log SD$; $r = -.62$; $n = 10$ [12]

D. DISCUSSION

The results of Experiment II verified the hypothesis that the value of the exponent decreased with the increasing range of the stimuli, but it remained to be seen what type of curve could be fitted to this relationship. A number of measures of the physical range of the stimuli in Experiments I and II (mean, median, largest, smallest distances, range, and standard deviation) were plotted against the four exponent values from the scales based on both the median and the mode. Various transformations of these data were attempted, and the best fit regression line was found to occur when logarithmically transformed exponent values were plotted against a logarithmic transformation of the range of the stimuli (equations 13 and 14).

Median: $\log \text{exponent} = 1.58 - .27 \log \text{range}$; $r = -.97$; $n = 4$ [13]

Mode: $\log \text{exponent} = 1.70 - .28 \log \text{range}$; $r = -.97$; $n = 4$ [14]

Again the median and mode scales produced very similar results, and the correlation coefficients were extremely high in both cases.

It would appear, therefore, that the exponent value in what has become recognized as the "inverse square root law" is not invariant, as has been suggested (4), but rather is a function of the range of stimuli with which S_s

are confronted. This conclusion is, however, based on a regression equation fitted to a rather limited number of points ($n = 4$) and consequently needs to be corroborated by further research. Moreover, the difference between the present results and those of Ekman and Bratfisch may be attributable in part to cultural variables associated with the fact that the pioneering work was conducted in Europe in contrast to the present study which was undertaken in Australia.

REFERENCES

1. BRATFISCH, O. A further study of the relation between subjective distance and emotional involvement. *Acta Psychol.*, 1969, **29**, 244-255.
2. BRATFISCH, O., & LUNDBERG, U. Subjective distance and emotional involvement: Experimental validation of the inverse square root law. Report Psychological Laboratories, No. 332, University of Stockholm, Sweden, 1971.
3. BRATFISCH, O., EKMAN, G., LUNDBERG, U., & KRÜGER, K. Subjective temporal distance and emotional involvement. *Scand. J. Psychol.*, 1971, **12**, 147-160.
4. DORNIC, S. Subjective distance and emotional involvement: A verification of the exponent invariance. Report Psychological Laboratories, No. 237, University of Stockholm, Sweden, 1967.
5. EKMAN, G. Two generalized ratio scaling methods. *J. of Psychol.*, 1958, **45**, 287-295.
6. EKMAN, G., & BRATFISCH, O. Subjective distance and emotional involvement: A psychological mechanism. *Acta Psychol.*, 1965, **24**, 446-453.
7. EKMAN, G., & LUNDBERG, U. Emotional reaction to past and future events as a function of temporal distance. *Acta Psychol.*, 1971, **35**, 430-441.
8. EKMAN, G., & SJÖBERG, L. Scaling. *Ann. Rev. Psychol.*, 1965, **16**, 451-474.
9. LUNDBERG, U., & EKMAN, G. Emotional involvement while anticipating an examination: A psychophysical study. *Percept. & Motor Skills*, 1970, **31**, 603-609.
10. LUNDBERG, U., BRATFISCH, O., & EKMAN, G. Emotional involvement and subjective distance: A summary of investigations. *J. Soc. Psychol.*, 1972, **87**, 169-177.
11. MASHHOUR, M. Psychological Relations in the Perception of Velocity. Stockholm: Almqvist & Wiksell, 1964.
12. STANLEY, G. Emotional involvement and geographic distance. *J. Soc. Psychol.*, 1968, **75**, 165-167.
13. ———. Emotional involvement and subjective distance. *J. Soc. Psychol.*, 1971, **84**, 309-310.

Department of Geography
The University of New England
Armidale, New South Wales, Australia 2351

DEVIANCE, POWER, AND THE OCCULT: A FIELD STUDY*

Vassar College

FREDRICK J. SCHEIDT

SUMMARY

It was predicted that occultists (witches, magicians, and spiritualists) would exhibit more seriously negative preoccult behavioral labeling than would more traditional religionists, and also that occultists would evidence a greater degree of latent power than the nonoccultists. Content analysis of data obtained from structured interviews supported both predictions. It is suggested that these occult belief-systems may provide a convenient vehicle for the maintenance of environmental control for those persons possessing irrational attribution schemata.

A. INTRODUCTION

A re-emergence of interest in supernatural and occult phenomena has occurred in recent years. Aside from popular anecdotal reports (9) and the efforts of a few behavioral researchers (16, 21), little research exists on persons who maintain occult life-styles and belief-systems. The present research sought to extend knowledge in this area by applying two increasingly important social psychological variables—deviancy and power—to participants of occult and more traditional religious belief-classes.

While deviance has been conceived in a variety of "models" (10), a recent theoretical orientation defines deviant behavior as behavior that others so label (1). This conception of deviance is concerned with the social context in which the conditions of negative labeling occur. It distinguishes between simultaneous and sequential models of deviance and holds that all causes do not operate simultaneously, but that patterns of behavior develop in an orderly sequence (1). Lemert (11) provided the foundation for this approach, distinguishing between primary and secondary deviation. The primary deviant is an actor whose initial behaviors have come to be labeled as deviant by others. When and if the actor reacts to this initial labeling, it is possible that he may become a secondary deviant, or one

* Received in the Editorial Office on December 21, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

whose self-concept and activities have come to conform substantially to the deviant image that others have of him (20).

Viewing occultists as possible secondary deviants, the present study predicted that occultists (witches, magicians, and spiritualists) would exhibit more seriously negative primary deviant labeling than persons participating in more traditional religious belief-systems. Occultists, in other words, were expected to evidence a greater degree of negative behavioral labeling prior to their entrance into their present belief-systems than the traditional religionists.

Like deviance, power is receiving increasing empirical attention. While commendable reviews exist (14, 17), the most useful conception of power for the present research is the distinction between latent and manifest power provided by Minton (14). Latent power, the psychological concomitant of manifest or observable power, is conceived as a disposition, attitude, set, or expectancy toward creating changes within the environment. Rotter's internal-external locus of control variable (15) reflects a continuum of latent power (18). High latent power is synonymous with internal control or the perception that reinforcement is contingent upon one's own actions; external control, where reinforcement is perceived as due to external sources, is comparable to low latent power.

Many occult belief-systems (witchcraft, magic) may be viewed as involving assumptions of influence and influence attempts (5). Several researchers have contrasted the greater manipulative attitude found in magic to that characterizing more traditional religious systems (4, 6, 12). The second major prediction of the study was that occultists (witches, magicians, and spiritualists) would exhibit a greater degree of powerfulness or internal control (latent power) than persons participating in more traditional religious belief-systems. Support for this prediction would raise questions vital to the study of attribution processes, perceived locus control, and the maintenance of self-perceptions of high latent power.

B. METHOD

1. *Belief-System Classification*

There is sound precedent for comparing occult and more traditional religious belief-systems. A number of anthropological and sociological writers have noted the similarities between various occult and more traditional religious belief-classes (6, 13, 22). Goode (6) stated that magic and religion (a) are both concerned with the unempirical; (b) are both pervasively symbolic; (c) share a similar stance to Western science; (d) share the use

of ritual systems; (e) contain "anthropopsychic" entities which are assumed to have separate mentalities and can be threatened, cajoled, or addressed; and (f) both require a specialized set of skills to deal with the forces. After surveying the similarities and the integral association of magic and religion, Ferm (3) concluded that all religions use magic.

To assure a broad range of comparison, four belief-classes distinguishable along a traditional-nontraditional (church-sect-cult) continuum were used. These were Methodism, Pentecostalism (particularly represented by the Charismatic Renewal Movement), spiritualism, and witchcraft and/or magic.

The beliefs and activities of witchcraft and magic were considered similar enough to warrant their inclusion into one belief-class. Both systems involve the use of materials, rites, and spells believed to be automatically effective for the fulfillment of desires. Both also involve beneficent and malevolent intents: i.e., white or black magic or witchcraft (3). Also, while there are several varieties of witchcraft and magic, the operating principles and assumptions are generally quite similar (2). More importantly, witches and magicians in the present study applied these labels interchangeably to themselves.

2. Subjects

A total of 37 subjects were used: Methodists ($N = 9$, five females and four males); Pentecostals ($N = 10$, five males and five females); spiritualists ($N = 7$, five females and two males); and witches-magicians ($N = 11$, two females and nine males). Potential members of the Methodist belief-class were more abundantly available than those of other belief-classes used, but difficulties imposed by the content analysis of the data precluded selection of a larger sample here. While none of the participants in the study was obtained through random sampling, an attempt was made to achieve rough comparability of age and socioeconomic status across groups: Witches-magicians, 22 to 46 years ($\bar{X} = 34$); spiritualists, 20 to 62 years ($\bar{X} = 45$); Pentecostals, 17 to 40 years ($\bar{X} = 27$); Methodists, 30 to 68 years ($\bar{X} = 39$). Most subjects classified themselves as belonging in the middle-class (Center's self-placement item), with the exception of four spiritualists who classified themselves as members of the working-class.

3. Data-Gathering Techniques

Two field research methods were employed—the interview and participant observation strategies.

A schedule standardized interview was used; it consisted of 32 items administered in a prescribed order to all respondents. Content-bound items tailored to specific belief-classes were reworded slightly to encompass the meaning intended by the researcher. Most of the questions were of an indirect type. Items were also primarily "open," allowing the respondent to answer in his/her own words.

Items constructed to assess deviance included the following: "Has there ever been a time in your life when people have misunderstood you?"; "Has there ever been a time in your life when people have accused you of being 'crazy,' 'weird,' 'mentally ill,' 'sick,' etc?"; "If so, was this *before* or *after* your involvement in———[present belief-system]?"

Items assessing power included the following: "Is it within your personal power to solve any of the problems in the world [discussed earlier in the interview]?""; "Can a person be born with _____ powers?"; "Have your activities in _____ [belief-system] helped resolve problems in your personal life?"; "Can such problems [discussed earlier in the interview] be solved without the aid of or belief in _____ [present belief-system]?"

Other items assessed demographic data, self-concept, and attribution schemata.

Participant-as-observer and observer-as-participant strategies were employed. The former stance was used to engage the cooperation of witches-magicians and spiritualists. No attempt was made with any of the classes to disguise the identity of the researcher. Persons who had "practiced" witchcraft or magic (Kabbalistic, ceremonial) for at least five years were approached with the aid of a male informant (also a witch). The researcher eventually gained entrance into witch coven meetings and magical rituals. Interviews were administered to these persons after approximately four months of contact. Interviews with spiritualists were obtained after six months of researcher participation in spiritualist classes and seances. Pentecostal and Methodist interviews were obtained more easily via an observer-as-participant (single-session) contact role. All respondents lived in fairly large Midwestern cities.

C. RESULTS

While the participant observation data remained qualitative, a quantitative analysis of the interview data was possible. Content analysis of themes relating to the predictions was performed. A theme is an assertion or unit of meaning relating to a variable of interest; it may consist of a few words, a phrase, sentence, or series of sentences.

Before scoring systems were applied, each interview was transcribed and unitized. Unitizing is the process of reducing a grammatical unit into thematic units (7). Operating from a manual designed for this purpose, a theme-identifier (psychology graduate student) followed a set of general criteria for identifying themes relating to (a) primary deviance—themes relating to self-reports that prior to the respondent's adoption of the present belief-system, others had negatively labeled his/her behaviors, and (b) the degree of latent power exhibited by respondents in each belief-class.

Two value-assigners or coders (also psychology graduate students) then assigned numerical values to the identified themes. A more objective analysis might have been effected by eliminating interview content that revealed respondents' belief-system membership to the coders. It was concluded that such a procedure would have simultaneously eliminated thematic content related to the variables to be scored. Also, the rather dramatic contrast of the content of occultist interviews with those of other classes would have been difficult to eliminate. Consequently, no attempt was made to disguise the protocols from the coders. They were, of course, blind to the hypotheses.

Value-assignments for themes relating to primary deviance were based upon a five-point unidimensional scale ranging from +1 (no evidence of primary deviance) to +5 (much evidence of primary deviance). Power themes were scored on a seven-point, Likert-type bidimensional scale ranging from -3 (much powerlessness) to +3 (much powerfulness), with zero representing ambivalent or ambiguous theme content. Each respondent's scores were summated, and averages were calculated for each variable by dividing the summated scores by the number of themes for that variable.

Combined coder means and standard deviations (in parentheses) for primary deviance across the four groups were as follows: Methodists, $\bar{X} = 1.00$ (.0); Pentecostals, $\bar{X} = 1.60$ (.99); spiritualists, $\bar{X} = 1.75$ (1.30); and witches-magicians, $\bar{X} = 2.27$ (.99). Individual ratings by Coder A were as follows: Methodists, $\bar{X} = 1.00$ (.0); Pentecostals, $\bar{X} = 1.60$ (.97); spiritualists, $\bar{X} = 1.71$ (1.25); and witches-magicians, $\bar{X} = 2.59$ (1.07). Ratings for Coder B were as follows: Methodists, $\bar{X} = 1.00$ (.0); Pentecostals, $\bar{X} = 1.60$ (1.07); spiritualists, $\bar{X} = 1.78$ (1.35); and witches-magicians, $\bar{X} = 1.95$ (1.06). The interrater reliability coefficient (Pearson r) for these ratings was .86 ($df = 35$, $p < .01$). The coefficient is of respectable size when the problems of theme evaluation, coder training, and the diverse nature of the belief-system content are considered. Both coders independently attributed an absence of primary deviance to the theme content of the Methodists. Inferential analysis of the descriptive data here, even for

demonstrative purposes, was not performed because of the lack of variance for this group and the extremely small sample *N*s.

The prediction of greater primary deviance for the occult belief-systems was supported. The groups exhibited increasing evidence of primary deviance corresponding to their increasing deviation from the traditional "church" end of the "church-sect-cult" continuum. While group means for spiritualists and witches-magicians do not reflect a great degree of highly negative labeling, examination of the variance for each group indicates that instances of more serious negative labeling were present in these two belief-classes.

Means and standard deviations for coder ratings of power themes across groups for Coder A were as follows: Methodists, $\bar{X} = 4.25$ (.97); Pentecostals, $\bar{X} = 4.92$ (.56); spiritualists, $\bar{X} = 4.92$ (.31); witches-magicians, $\bar{X} = 5.54$ (.27). Ratings for Coder B for power were as follows: Methodists, $\bar{X} = 4.61$ (.64); Pentecostals, $\bar{X} = 5.19$ (.50); spiritualists, $\bar{X} = 5.03$ (.26); and witches-magicians, $\bar{X} = 5.79$ (.39). Combined means and standard deviations were as follows: Methodists, $\bar{X} = 4.43$ (.82); Pentecostals, $\bar{X} = 5.06$ (.55); spiritualists, $\bar{X} = 4.98$ (.29); and witches-magicians, $\bar{X} = 5.67$ (.36).

A 2×2 (Groups \times Coders) analysis of variance for unequal *N*s was calculated for demonstrative purposes on these power ratings. Significant main effects for Groups ($F = 10.81$, $df = 3, 33$, $p < .01$) and Coder differences ($F = 7.18$, $df = 1, 33$, $p < .01$) were obtained. While little may be inferred about any absolute degrees of displayed power within groups, the witches-magicians were rated as displaying a greater degree of perceived powerfulness than the remaining groups. There was a tendency for groups deviating most from the more traditional end of the belief-class continuum to exhibit greater evidence of perceived powerfulness. As to the obtained coder differences, Coder B rated the belief-classes consistently higher on this variable than did Coder A. Fortunately, the direction of B's ratings was similar to those of Coder A. The interrater correlation coefficient (Pearson r) for these power ratings was .70 ($df = 35$, $p < .01$).

D. DISCUSSION

Despite the retrospective nature of the data collection, the results support the contention that occultists in the present study exhibited behaviors that others labeled as deviant even prior to the participants' entrance into their respective occult belief-systems. Reports of persons in more traditional religious classes exhibited less primary deviant labeling. It is possible, of course, that these latter individuals were simply unaware of labeling that might

have occurred or were more reluctant to report knowledge that might have made them appear deviant.

It is also difficult to determine how much occultists' reactions to primary deviant labeling may have affected their movement into the occult. Such occultist reactions may have been partially causal to their adoption of the occult belief-systems, as Lemert might posit. A more likely alternative, perhaps, is that occultists exhibited irrational attribution schemata which mediated the production of initial primary deviant behaviors. While the verbal report data indicated that occultists' motives for entrance into these belief-systems were similar in many ways to those of more traditional religionists, some spiritualists and witches-magicians reported instances of more seriously negative preoccult behavioral labeling. For example, two of the witches reported a history of institutionalization for more serious behavior disorders. No such reports occurred in the other belief-classes employed. It is possible that the occult belief-systems, with their own internal logic yet irrational views of cause and effect (as revealed in the interviews), served as adaptive means for the maintenance of a minimal degree of perceived environmental control for some participants.

The prediction that occultists would exhibit greater evidence of latent power was supported. If one accepts the similarity of the latent power and the internal-external (I-E) dimensions, this finding contrasts with earlier research (8, 16) which showed that college students high in external control exhibited more positive attitudes toward supernatural and superstitious beliefs than the internals. The relation of I-E control and beliefs in supernatural events must be examined in terms of the degree of personal involvement maintained in such systems, as well as with such variables as religious orientation (intrinsic-extrinsic) and background factors (19).

Of central interest is how occultists maintained perceptions of powerfulness when evidence of valid manifest power effects (deriving from hexes, rites) was low or absent. Two primary processes for such maintenance functions used by occultists in the present study were (a) the application of natural and human efforts to achieve personal aims while simultaneously believing that causes of such results were supernatural, and (b) the integration of coincidentally related independent events mediated by beliefs in supernatural causation.

It would be of great aid to have knowledge of levels of preoccult I-E control for these respondents. It is possible that externals (low perceived powerfulness) experienced difficulty controlling environmental events and hence adopted belief-systems that allowed them to maintain a feeling of greater environmental control. As the data on deviance and power suggest,

the hypothesis that occult belief-systems may provide ready-made vehicles for those persons seeking a resource system to deal more effectively with the environment deserves greater empirical attention. Also, while it is difficult to assess the contribution of demographic variables to the present results, more careful control of such factors may lead to a clearer understanding of possible mediators for obtained effects.

REFERENCES

1. BECKER, H. S. *The Outsiders: Studies in the Sociology of Deviance*. New York: Free Press, 1963.
2. BONEWITS, P. E. *Real Magic*. Berkeley, Calif.: Medallion, 1972.
3. FERM, V. *Encyclopedia of Religion*. Paterson, N. J.: Littlefield, Adams, 1964.
4. FRAZIER, J. G. *The Golden Bough*. New York: Macmillan, 1922.
5. GAYNOR, F., Ed. *Dictionary of Mysticism*. New York: Citadel Press, 1968.
6. GOODE, W. J. Religion and magic. In J. M. Yinger (Ed.), *Religion, Society, and the Individual: An Introduction to the Sociology of Religion*. New York: Macmillan, 1957.
7. HOLSTI, O. R. *Content Analysis for the Social Sciences and the Humanities*. Reading, Mass.: Addison-Wesley, 1969.
8. JAHODA, G. Supernatural beliefs and changing cognitive structures among Ghanaian university students. *J. Cross-Cult. Psychol.*, 1970, 1, 115-130.
9. JOHNSON, W. The belief in magic. *Rational Living*. 1970, 4, 11-15.
10. KISKER, G. W. The theoretical models of normality. In R. V. Guthrie (Ed.), *Encounter: Issues of Human Concern*. Menlo Park, N. J.: Cummings, 1970.
11. LEMERT, E. M. *Social Pathology*. New York: McGraw-Hill, 1951.
12. LOWIE, R. H. *Primitive Religion*. New York: Liveright, 1924.
13. MALINOWSKI, B. Magic, science, and religion. In J. Needham (Ed.), *Science, Religion, and Reality*. New York: Macmillan, 1925.
14. MINTON, H. L. Power as a personality construct. In B. A. Maher (Ed.), *Progress in Experimental Personality Research (Vol. 4)*. New York: Academic Press, 1967.
15. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, 80(1), Whole No. 609.
16. SCHEIDT, R. J. Belief in supernatural phenomena and locus of control. *Psychol. Rep.*, 1973, 32, 1159-1162.
17. SCHOPFLER, J. Social power. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology (Vol. 2)*. New York: Academic Press, 1965.
18. SEEMAN, M. On the meaning of alienation. *Amer. Sociolog. Rev.*, 1959, 24, 783-791.
19. SHRAUGER, J. S., & SILVERMAN, R. E. The relationship of religious background and participation to locus of control. *J. Sci. Stud. Relig.*, 1971, 10, 11-16.
20. SHUR, E. M. *Labeling Deviant Behavior: Its Sociological Implications*. New York: Harper & Row, 1971.
21. TRUZZI, M. Definition and dimensions of the occult: Towards a sociological perspective. *J. Pop. Cult.*, 1971, 5, 635-646.
22. YINGER, J. M., Ed. *Religion, Society, and the Individual: An Introduction to the Sociology of Religion*. New York: Macmillan, 1957.

Department of Psychology
Vassar College
Poughkeepsie, New York 12601

EFFECTS OF DIRECT AND INDIRECT PRAISE AND BLAME ON ATTRIBUTION*¹

Behavioral Science/Marketing Research Unit, Faculty of Management, McGill University

RABINDRA N. KANUNGO AND LEONARD NORMAN

SUMMARY

The effects of direct and indirect praise and blame on correspondence of inference were examined in a minimal social interaction setting involving female triads. Two measures of correspondence of inference—trait ratings and confidence ratings—were used. Results indicated that (a) correspondence of inference about an actor is greater when the actor praises rather than blames, and (b) a person more directly involved in an interaction either as an actor or as an informer will be perceived with greater correspondence of inference. The results are explained in terms of "credibility effect" and "face engagement" variables. The need for extending the theory of "correspondent inference" to include the above variables is emphasized. Several methodological and conceptual problems encountered in the study were discussed.

A. INTRODUCTION

The theory of "correspondent inference" (7) attempts to analyze systematically the nature of perceiver's (*P*) inference process of attributing dispositions to a person or actor (*A*). According to the theory, when *P* infers dispositions of *A* as a way of accounting for the latter's action, these attributes may vary in the degree to which they correspond with the action they are intended to explain. The concept of *correspondence*, therefore, refers to the extent that the observed act and the inferred attribute (the perceived cause of the act) are similarly described by the inference. Thus, the more the observed actions and the inferred disposition are matched in *P*'s mind, the more correspondent is *P*'s inference regarding *A*'s disposition.

* Received in the Editorial Office on December 31, 1973, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research was supported by Canada Council Grant No. 68-1105 to the first author.

The theory suggests that the more socially desirable an act is, the less information it provides about the dispositions of *A*, and hence, the lower is the level of correspondence of inference. It has also been suggested that the more unexpected or out-of-role an act is, the more revealing it is about *A*'s "internal" motivation and dispositions. Jones, Davis, and Gergen (10) demonstrated this quite clearly by manipulating in-role and out-of-role behavior. They found that out-of-role stimulus persons are perceived by *Ss* as revealing more of their unique characteristics and are rated with greater confidence than in-role stimulus persons on a number of relevant trait clusters.

In order to test the validity of the theory, two operational measures of the correspondence of inference have been suggested. First, as Jones and Harris (9) point out, "... the correspondence of [an] inference increases as the judged value of the trait departs from the judge's conception of the average person's standing" (p. 2). Thus, correspondence may be measured on a trait dimension or a scale in terms of the amount of discrepancy from an average person's position on this scale. Correspondence would then be operationally defined as the *amount of discrepancy or polarization of *P*'s rating of *A* on a number of trait dimensions*. The second measure of correspondence is the degree of confidence with which *P* rates a trait of *A*. Depending on how directly the trait is reflected in the act, *P* will be more or less confident of his trait rating. High or low confidence may be measured on unipolar confidence rating scales indicating high or low levels of correspondence, respectively. Using these two operational measures, the theory predicts that *A* would receive from *P* a more polarized rating on a trait dimension, and *P*'s confidence ratings would be higher when *A*'s act is perceived as either socially undesirable or unexpected and out-of-role than when it is perceived as either socially desirable or in-role.

The present research was an attempt to test the generality of the above theory in a minimal social interaction situation involving a female triad. The nature of the inference process in the initial stages of impression formation, where *P* herself was the target of praise or blame, was studied. Common sense would suggest that if *A* praises *P*, *A* would be rated as having more likable (friendly) dispositions, whereas if *A* blames *P*, the former would be rated as having less likable dispositions. But, within the framework of correspondent inference theory, when *P* is the target of praise or blame, which condition will yield the more correspondent inference about *A*? Or, operationally speaking, which condition will result in the more

polarized ratings and higher confidence ratings? In Western culture, praising or complimenting someone verbally is considered a highly socially desirable act. However, blaming or accusing someone is considered socially less desirable. Thus, the theory would predict that correspondence of inference in the case of praise would be less compared to the inference in the case of blame. In operational terms, praise would yield a less discrepant or extreme trait rating and a lower confidence rating than blame.

Another variable which may have a potential influence on the correspondence of inference is the manner in which *P* receives the praise or blame from *A*. *P* may be praised or blamed directly to her face (*direct* condition) or she may be praised or blamed behind her back (*indirect* condition) and be informed of the remark by a third person. The question is raised whether the correspondence of inference will differ for the direct and indirect conditions; that is, which will give the more discrepant trait ratings and higher confidence ratings? It is assumed that in the direct condition *A* shows in-role and situationally justified behavior. In other words, by praising or blaming *P* to her face, *A*'s behavior is justified by *P*'s presence. *P* may think of *A*'s praise or blame as either a manifestation of *A*'s dispositions, or simply *A*'s reactions to situational demands (i.e., *P*'s presence). The ambiguity of intention which arises from *A*'s behavior may cause doubts in *P*'s mind. Consequently she may be less confident of inferring certain dispositional characteristics of *A*, and her trait ratings of *A* may be less polarized. In the indirect condition, however, *A* shows out-of-role or situationally unjustified behavior (talking about *P* behind her back). The absence of *P* (lack of any situational demand) during praise or blame administration by *A* may make *P* feel more confident in attributing the cause of the praise or blame to the dispositions of *A*. Her trait ratings of *A* may also be more polarized. In short, within the framework of correspondent inference theory, if *P* is herself the target of praise or blame, the direct condition will yield a lower level of correspondence than the indirect condition.

B. METHOD

1. Subjects

Sixty female undergraduate students served as *Ss*. None of them had participated in a psychological experiment before. Each *S* was tested individually in two separate experimental sessions.

2. Procedure

The experiment made use of two female confederates, C_1 and C_2 , who joined the S in forming a triad. The S was introduced to C_1 and C_2 as two other subjects participating in the experiment. There were two sessions of the experiment with an interval of approximately 24 hours between them. All the S s were treated in similar manner in the first session, but they were randomly assigned to four different conditions during the second session.

a. First session. Soon after the S and C_1 and C_2 arrived in the experimental room, they were introduced by the experimenter (E) as three different S s and were instructed as follows:

The experiment in which you are about to participate deals with the processes involved in group problem solving. We are trying to determine the factors influencing the efficiency of groups performing intellectual tasks. We are using several groups of triads, and your group is one of them. The study will make use of several intellectual tasks to be performed by your group. They will be spread over two days in order to avoid very lengthy experimental sessions that may cause fatigue. Therefore, besides today's session which will continue for approximately half an hour, your cooperation will be needed for another half-hour tomorrow.

Since several groups are participating in these competitive tasks, we have decided to give a token monetary reward of \$1.50, or its equivalent (movie ticket), to each member of each of the four most efficient groups. The efficiency of each group will be judged on the basis of the total score of each individual member over all the tasks. Today's task is to solve 60 anagrams within five minutes. The group score will be determined by the total number of anagrams (out of 60) solved by all three of you.

The E then handed over a sheet containing three rows of 20 anagrams in each of equal difficulty (5) and an answer sheet to each member of the group. The group members were allowed one minute to decide for themselves (this provided a short period of social interaction for the S) how they were going to perform the task so that they could solve the maximum number of anagrams within the five minute period.

Within this period of social interaction the confederates behaved in a predetermined manner. For half of the groups (or S s), C_1 came up with the suggestion that the best way to maximize the group score was to divide the task among the three members. Immediately after this suggestion, C_2 suggested that the first row of 20 anagrams be given to the S to solve; the second row be given to C_1 , and the last row be given to herself. For the other half of the groups (or S s), C_2 suggested dividing the task among themselves and C_1 further suggested assigning the three rows of anagrams.

The *S* was asked to give her consent to these proposals. Since a division of the task was the best strategy for securing the maximum group score and the time for the decision was limited, it was expected that the *S* would agree with the suggestions without causing further delay.

Each member of the group was then put into a separate booth and allowed to perform the task for five minutes, at the end of which the answer sheets were collected. Then *E* handed over to each member a booklet containing the following instructions:

We are also interested in finding out how people form impressions of others, especially when they have very limited information to go on. Thus you will find in this booklet several scales to rate the other two members of your team on various personality traits. For each of your ratings, you are also required to indicate your degree of confidence. Since you are not giving out your name on this booklet, please feel free to give your frank impression about the other two members of your group.

E then impressed upon each *S* the importance of not missing any of the rating scales. They were told it was necessary to utilize all the scales in order that *S*'s total impression of the other two persons be assessed. If scales were missed inadvertently, or otherwise, the entire booklet of scales would be invalid, and the rating would have to be repeated. The booklet contained 16 traits on each of which the *S* rated C_1 and C_2 . Several of the traits were chosen from earlier studies (8), but the main consideration in choosing the traits for the booklet was to reflect *S*'s impression of the confederates' personality on the general dimension of "likableness" (1). The traits included in the booklet were as follows: *alert, attractive, clear-thinking, creative, forceful, hard-working, honest, intelligent, likable, persevering, popular, responsible, sharp-witted, sincere, trustworthy, and warm*. In terms of Anderson's (1) normative "likableness" values, most traits belonged to the highly likable category. The *S* was then asked to give her confidence rating for each trait. The trait ratings were on an 11-point scale. One end of the scale was labelled "below average," the other "above average." The midpoint on the scale was given as the average person's standing. The confidence ratings were on a seven-point scale ranging from "least" to "most" confident.

Soon after the ratings, the *E* announced that each member had a similar score—a score that corresponded to the *S*'s score on the anagram task—and that each member should come back the next day for a second session. They were permitted to take the anagram sheet home with them.

b. Second session. In this session, the *Ss* were assigned to one of the

four conditions. In each of the conditions, one of the confederates (for half of the Ss she was C_1 , and for the other half she was C_2) arrived only after the administration of praise or blame to the S by the other confederate. The latter arrived a little earlier than the S. The confederates may be referred to as the late-arriving and the early-arriving confederate. Soon after S's arrival, the early-arriving confederate behaved in a predetermined manner for the purpose of administering direct or indirect praise or blame.

In the direct conditions, the early-arriving confederate played the role of the *actor* (the source of praise and blame), whereas in the indirect conditions she played the role of the *neutral informer* of praise or blame initiated by the actor. The late-arriving confederate served as the *neutral control* person in the direct conditions and as an actor in the indirect conditions.

(1). In the *direct praise condition*, the early-arriving confederate (actor) told the following to the S with accompanying facial expression of satisfaction:

I really think you did a very fine job yesterday considering the set of anagrams you worked on. In fact, I tried it myself last night and found your set of anagrams rather difficult compared to the other two sets. As a member of our team you contributed the most and I think it was on account of you that we stand a chance of winning.

(2). In the *direct blame condition*, the early-arriving confederate (actor) told the following to the S with accompanying facial expression of dissatisfaction:

I really think you did a very poor job yesterday considering the set of anagrams you worked on. In fact, I tried it myself last night and found your set of anagrams rather easy compared to the other two sets. As a member of our team, you contributed the least and I think it was on account of you that we stand a chance of losing.

(3). In the *indirect praise condition*, the early-arriving confederate (neutral informer) told the following to the S:

I met the other member of our team this morning. She told me that she really thinks you did a very fine job yesterday considering the set of words you worked on. She tried it herself last night and found your set of anagrams rather difficult compared to the other two sets. She said that as a member of our team, you contributed the most, and she thinks it was on account of you that we stand a chance of winning.

(4). In the *indirect blame condition*, the early-arriving confederate (neutral informer) told the following to the S:

I met the other member of our team this morning. She told me that she really thinks you did a very poor job yesterday considering the set of words

you worked on. She tried it herself last night and found your set of anagrams rather easy compared to the other two sets. She said as a member of our team, you contributed the least and she thinks it was on account of you that we stand a chance of losing.

Soon after the early-arriving confederate finished her conversation with the *S*, the late-arriving confederate and *E* entered the room. Then *E* gave the following instruction to the group:

Before I give you today's task for measuring your team's performance, I shall ask you for a favor. Yesterday, I found a page missing from one of the rating booklets. As a result, a number of traits were missing from the booklet. This invalidates your previous responses, and we cannot make use of them for our analysis. Would all three of you please fill out the rating booklet once again for me? Remember that you have to rate your team mates on several personality traits.

With this instruction, each member of the group was asked to go to separate booths and was given a booklet for the ratings. After the *S* finished her rating, she was told that the experiment was over. Then a short questioning period followed to ascertain whether the *S*'s suspicions had been aroused by the experimental manipulations. Finally, *Ss* were debriefed on the whole purpose of the experiment and the deceptions involved and were paid \$1.50 each for their participation in the study.

C. RESULTS

1. *Analysis of Trait Ratings*

a. *Direction of change in trait ratings.* In order to ascertain whether experimental administration of praise and blame by the actor was effective in influencing the *S*'s ratings of the actor to move in more or less likable directions, respectively, the directions of change from the *S*'s initial (pre-treatment) to her final (posttreatment) ratings were analyzed. It may be recalled that the *Ss* rated both the actor and neutral person twice on 11-point scales with ordinal weights of 1 to 11 in which the higher scores indicated more positive ratings and the lower scores indicated less positive ratings. The mean initial trait rating for each *S* was obtained from the sum of all the 16 trait scale scores. Since there were 15 subjects in each of the four conditions (direct praise, direct blame, indirect praise, and indirect blame), the mean initial trait rating score for a given condition was obtained by averaging the mean scores of the 15 *Ss* in that condition. This scoring procedure was followed for both the actor and the neutral person. A $2 \times 2 \times 2$ analysis of variance (praise-blame, direct-indirect, and actor-neutral)

performed on the initial ratings revealed no significant differences among the various conditions.

The results of a similar $2 \times 2 \times 2$ analysis of variance of the final trait ratings, however, revealed a significant interaction between actor-neutral and praise-blame variables [$F(1, 56) = 11.15, p < .01$]. The interaction can be explained by the fact that while there was a significant difference between the praise (mean = 6.67) and blame (mean = 6.24) conditions for the actor ($t = 2.63, p < .05$), no such difference was observed for the neutral person (means = 6.54 and 6.67 for praise and blame conditions, respectively). The interaction can be more clearly understood if one compares the initial and final ratings for both the actor and the neutral person separately. The trait ratings for the actor and the neutral person are presented in Table 1.

Inspection of Table 1 reveals that administration of praise or blame by the actor influenced the Ss' final ratings to move in the more (higher mean) or less (lower mean) likable direction, respectively. These changes in the direction of ratings were significant in all conditions except the indirect blame condition. Inspection of the mean ratings for the neutral person reveals some interesting findings. In the direct conditions, the neutral person acted as a neutral control. She was not the source of either praise or blame directed to the S and was truly neutral by being absent during the actual administration of praise or blame by the actor to the S. Thus, as expected, S's final ratings of the neutral control did not change in any significant way from her initial ratings. In the indirect conditions, however, the final ratings for the neutral person who acted as an informer of praise or blame moved significantly in the more likable direction. This suggests that we as perceivers would tend to form a very favorable impression of a person who acts not as the source but as an informer of a message, regardless of whether the message supports or damages our self-esteem.

b. Polarity of trait ratings. The correspondence of inference involved in attribution of disposition of likableness to the actor and the neutral person was measured by the polarity of trait ratings. The polarity of a trait rating was indexed by the absolute amount of discrepancy of the rating from the midpoint (with an ordinal weight of 6) of the 11-point scale. For example, when the trait rating was either 5 or 7, the polarity of the rating was 1 in either case. In order to determine the effects of direct and indirect praise and blame on the correspondence of inference, polarity-difference scores from each S's ratings were calculated by subtracting the polarity of initial

TABLE 1
INITIAL AND FINAL MEAN TRAIT AND CONFIDENCE RATINGS FOR
ACTOR AND NEUTRAL UNDER FOUR CONDITIONS

Type of involvement	Condition			
	Direct praise	Indirect praise	Direct blame	Indirect blame
<i>Trait ratings</i>				
Actor				
Initial	6.34	6.31	6.54	6.36
Final	6.53	6.80	6.25	6.24
<i>t</i>	2.14**	3.93***	2.29**	1.25
Neutral ^a				
Initial	6.34	6.28	6.49	6.33
Final	6.29	6.79	6.57	6.77
<i>t</i>	< 1	2.46**	< 1	2.65**
<i>Confidence ratings</i>				
Actor				
Initial	4.10	4.11	4.11	4.00
Final	4.81	4.45	4.15	3.95
<i>t</i>	4.00***	1.94*	< 1	< 1
Neutral ^a				
Initial	4.07	4.06	4.09	3.99
Final	4.01	5.21	4.07	4.10
<i>t</i>	< 1	8.65***	< 1	< 1

^a In the direct conditions, neutral means neutral control, whereas in the indirect conditions, it means neutral informer.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

trait ratings from the polarity of final trait ratings. Higher polarity-difference scores indicated greater correspondence of inference. Two mean polarity-difference scores, one for the actor and the other for the neutral person, were obtained from each *S*'s ratings by averaging the 16 polarity-difference scores in each case. A $2 \times 2 \times 2$ analysis of variance was performed on the polarity-difference scores. The three classifications were praise-blame, direct-indirect, and actor-neutral. The main effect of praise-blame [$F(1, 56) = 8.58, p < .01$] and its interaction with actor-neutral [$F(1, 56) = 8.12, p < .01$] were significant. The polarity-difference scores were higher in praise than in blame conditions, and this tendency was clearly noticed for *S*'s ratings of the actor and not of the neutral person. However, it may be recalled that the design of the study provided for two different neutral person roles. In the direct conditions, the neutral person served as a control by not entering the social interaction between the *S* and the actor. But, in the indirect conditions the neutral person acted as an informer. Thus without

separate analysis of polarity-difference scores for the actor, the neutral informer, and the neutral control, the results are difficult to interpret in any meaningful manner. This necessitated separate comparisons of the polarity-difference scores for the actor and the neutral informer with the neutral control under both praise and blame conditions. Such comparisons are presented in Table 2.

TABLE 2
COMPARISONS OF MEAN POLARITY-DIFFERENCE SCORES AND
MEAN CONFIDENCE-DIFFERENCE SCORES FOR ACTOR AND
NEUTRAL INFORMER WITH NEUTRAL CONTROL

Condition	Mean	t
<i>Polarity-difference scores</i>		
Praise		
Neutral control	.74	
Actor under direct praise	1.06	1.81*
Actor under indirect praise	1.31	3.22***
Neutral informer	1.12	2.13**
Blame		
Neutral control	.89	
Actor under direct blame	.86	< 1
Actor under indirect blame	.79	< 1
Neutral informer	1.27	2.13**
<i>Confidence-difference scores</i>		
Praise		
Neutral control	-.06	
Actor under direct praise	.71	4.05***
Actor under indirect praise	.35	2.15**
Neutral informer	1.15	5.90***
Blame		
Neutral control	-.02	
Actor under direct praise	.04	< 1
Actor under indirect praise	-.05	< 1
Neutral informer	.12	< 1

* $p < .10$.

** $p < .05$.

*** $p < .01$.

In Table 2 it will be seen that all mean polarity-difference scores are positive. This indicates a general increase in the correspondence of inference in attributing dispositions during the final rating as compared to the initial rating. Such a trend is expected on the basis of increased familiarity with the stimulus person. The more important fact to ascertain, however, is whether the various experimental treatments had any effect on polarity of ratings reflecting correspondence of inference. The mean comparisons reveal that, as compared to the neutral controls, the polarity-difference scores for

the actor were greater only for praise and not for blame conditions. Besides, for the actor there was no significant difference between direct and indirect praise conditions. Compared to same neutral controls, the polarity-difference scores for the informer were greater in both praise and blame conditions.

2. Analysis of Confidence Ratings

a. *Direction of change in confidence ratings.* The confidence ratings were analyzed for both the actor and the neutral person to determine the direction and degree of change in the Ss' confidence. This was done in order to ascertain if the administration of praise and blame by the actor affected Ss' confidence so that they were either more or less confident in their ratings of the actor after the experimental treatments. It was assumed that an increase in Ss' confidence in the final ratings would indicate an increase in the correspondence of their inferences, and similarly, a decrease in confidence would indicate a decrease in the correspondence of inferences.

The Ss rated their own trait ratings of the actor and neutral person on seven-point confidence scales ranging from 1 ("least confident") to 7 ("most confident"). For each of the 16 traits contained in booklet there was a corresponding seven-point confidence scale. The average confidence rating for each subject was obtained from the 16 confidence scale scores. The total mean confidence score for a given condition was obtained by averaging the mean scores of the 15 Ss in that condition. In this way, mean confidence rating scores were obtained for both the actor and neutral person in both the initial and final ratings. The results of a $2 \times 2 \times 2$ analysis of variance (praise-blame, direct-indirect, actor-neutral) of the initial confidence ratings showed no significant difference among the conditions. The means for each condition are given in Table 1.

A similar $2 \times 2 \times 2$ analysis of variance of the final posttreatment confidence ratings revealed the main effect of praise-blame [$F(1, 56) = 13.46$, $p < .01$] and two other interactions to be significant. The reason for the first significant triple-order interaction [$F(1, 56) = 13.76$, $p < .01$] between actor-neutral, praise-blame, and direct-indirect can be seen from the mean confidence final ratings presented in Table 1. Under praise conditions (direct and indirect combined), Ss were more confident in rating both the actor (mean = 4.63) and the neutral person (mean = 4.56) than under blame conditions (means = 4.05 and 4.08, respectively). On the other hand, while the Ss were more confident in rating the neutral person under the indirect (mean of praise and blame combined = 4.66) than under the direct condition (mean = 4.04), the reverse was true for the

actor (means for direct and indirect conditions with praise and blame combined were 4.48 and 4.20, respectively). The latter finding is the reason for the second significant interaction between direct-indirect and actor-neutral classifications [$F(1, 56) = 25.62, p < .01$]. The above results were suggestive of the fact that praise from the actor results in greater confidence ratings of the actor than blame, and that direct administration of praise and blame results in greater confidence ratings of the actor than indirect administration. This can be more clearly seen from the comparisons of the initial and final mean confidence ratings for the actor as presented in Table 1. The direct praise condition yielded the greatest amount of increase in Ss' confidence, followed by indirect praise. In both the blame conditions, the final confidence ratings did not change very much from the initial confidence ratings. Besides, it will be noticed that the effects of direct conditions on Ss' confidence level in attributing dispositions to the actor are largely due to direct praise rather than direct blame.

It was indicated earlier that the neutral person was rated more confidently in the indirect conditions than in the direct conditions. This would be expected on the ground that the neutral person acted as an informer in the indirect conditions, whereas she acted as a control in the direct conditions. An examination of the mean initial and final confidence ratings for the neutral person in Table 1 reveals that the final confidence ratings for the neutral informer (indirect conditions) showed a significant increase only in the praise condition. For the neutral control (direct conditions) there was no change in Ss' confidence ratings. The results suggest that when a person is directly involved in an interaction either as an actor or as an informer, that person will be rated more confidently by the Ss. This trend, however, is noticed only for praise and not for blame administration.

b. Comparison with neutral control. The question may be raised whether the amount of increase in the final confidence ratings for the actor, after the administration of the experimental treatments, is significantly different from the increase in final ratings noticed for the neutral control. Likewise, one may ask whether the amount of increase in the final confidence ratings for the neutral informer is significantly different from that for the neutral control. In order to answer these questions, difference scores were calculated by subtracting the initial from the final confidence ratings for each S averaged over all the 16 scales. This procedure was followed separately for Ss' ratings of the actor, the neutral informer, and the neutral control. The mean confidence-difference scores under praise and blame conditions are presented in Table 2. A comparison of the mean scores for the actor with those of the appropriate control reveals that under both

direct and indirect praise, the Ss' confidence in attributing likable disposition to the actor was significantly greater than their confidence in attributing similar disposition to the neutral control. However, under the blame conditions, the Ss' confidence regarding the actor's likable disposition was no different from that for the neutral control. Thus, the results indicate that Ss showed greater confidence in rating a person on several highly likable traits (increased correspondence of inference) when the person administered praise rather than blame. Besides, there was a tendency for the Ss to show a greater confidence in rating the actor under the direct praise rather than under the indirect praise condition ($t = 1.97, p < .10$). Comparisons between the confidence-difference scores for the neutral informer with the neutral control reveals that Ss rated the informer more confidently on various traits (increased correspondence of inference) when she acted as an informer of praise rather than blame.

D. DISCUSSION

The mean trait ratings of the actor as presented in Table 1 suggest that praise and blame administered to the Ss were effective. The commonsense expectation that Ss would tend to look more favorably on the actor who praises them or less favorably on the actor who blames them was confirmed. However, more interesting findings were noticed with respect to attribution of the disposition of likableness to the informer. The informer was always perceived in more favorable terms regardless of whether she conveyed praise or blame from the actor to the Ss. Presumably, the informer was regarded by the Ss as someone who showed a friendly interest and personal concern for them. The findings, however, cannot be overgeneralized, and one might consider some possible limitations of this effect. For example, over a period of time, a consistent teller of tales could come to be negatively evaluated. This may be true particularly for a consistent informer of blame. Even a consistent informer of praise over a period of time may be seen as a flatterer and hence negatively evaluated.

Results presented in Tables 1 and 2 bear directly on the test of correspondence of inference as influenced by direct and indirect praise and blame conditions. Both the trait and confidence rating measures revealed that Ss showed greater correspondence of inference in attributing dispositions to the actor only under praise and not under blame condition. Even in the case of attributing dispositions to the neutral informer, it was the praise condition that resulted in greater correspondence of inference on both trait and confidence rating measures. These results are contrary to the expectation that blame conditions, because of social undesirability of blame admin-

istration, should produce greater correspondence of inference than praise conditions, at least in the case of the actor. A possible explanation of the anomaly in the results may stem from the fact that approving feedback or praise is accepted more readily as evidence of one's self-worth, than disapproving feedback, or blame (6). People apparently show a bias towards believing favorable information about themselves as being true. Besides the presence of such a bias, there is also a tendency for persons to maintain consistency between their evaluations and perceptions of themselves and their evaluations and perceptions of persons and events in the environment with which they interact (3). If it is assumed, therefore, that Ss evaluate themselves positively, another person making comments that agree with or support their self-concept is seen in a favorable light. The actor's compliments to Ss appear more truthful and credible because they agree with Ss' own opinions of themselves. Therefore, Ss see these complimentary remarks as an expression of the actor's true feelings and thus are more confident in attributing certain traits to the actor. This may be referred to as the "credibility effect." However, under the blame conditions, Ss find the actor's remarks difficult to believe because they are contrary to the positive self-image of the Ss. As a result, Ss may act defensively by either ignoring, denying, or making light of the remark. As a defense, Ss may think that the actor really does not mean what she says. Because of this, motives for the actor's actions (intentions) remain ambiguous, and Ss are less confident in attributing certain traits to her from her actions. The above reasoning also explains the greater confidence of Ss in rating the neutral informer when she conveys praise rather than blame.

There are other conceivable explanations why the blame conditions did not produce greater correspondence of inference. One may argue that Ss in blame conditions may have felt somewhat suspicious because of the nonnormative nature of the blame comments they received. Such suspicion on the part of Ss may have reduced the effects of blame on their final ratings. However, the postexperimental questionnaire given to the Ss did not detect any suspicious Ss in any of the conditions. The other plausible explanation that could not be verified with the available data may stem from the fact that Ss in the blame conditions might have made special efforts to conceal the full effects of blame on their final ratings because they did not like to see themselves as unable to take criticism. This is a form of defense that Ss may take when exposed to blame.

The expectation that persons praised or blamed behind their back rather than directly to their face would show greater correspondence of inference in attributing dispositions to the actor was not confirmed. No differ-

ence in correspondence of inference measures was noticed between direct and indirect conditions, except for a tendency on the part of the Ss to show greater confidence in rating the actor under direct rather than indirect praise condition ($t = 1.97, p < .10$). This tendency and the failure of the indirect conditions to produce greater correspondence of inference can be explained by what Goffman (4) calls "face engagements" in social interactions. "Face engagements comprise all those instances of two or more participants in a situation joining each other openly in maintaining a single focus of cognitive and visual attention. . ." (p. 89). During this encounter, "any message that an individual sends is likely to be qualified and modified by much additional information that others glean from him simultaneously, often unbeknownst to him. . ." (p. 14). If this is so, the transferral of additional information, or nonverbal communication from the actor, should occur only in the direct conditions and not in the indirect conditions. In the indirect condition, nonverbal cues from the actor (facial, bodily, etc.) are filtered out when the message is conveyed through an informer. Because of such a lack of additional information about the actor, the S's correspondence of inference remains at a low level. The same "face engagement" explanation also partly explains why Ss rated the neutral informer more confidently than the neutral control. Although the informer was not the originator of either praise or blame, she nevertheless confronted Ss directly in a face engagement and, therefore, revealed more about herself to the Ss. On the other hand, the neutral control person was entirely outside the interaction and, therefore, did not provide any additional information about herself to the Ss for the final rating.

The notion of correspondence of inference was defined operationally in terms of two dependent variables measures: trait polarity ratings and confidence ratings. It was expected that behavioral changes picked up by one measure should also be picked up by the other. This expectation was confirmed. Both trait-polarity ratings and confidence ratings yielded similar results, as are shown on Tables 1 and 2. This, however, does not imply that the two measures are conceptually identical. In fact they are conceptually independent measures. One can rate a person as possessing an attribute to an average extent, and yet he may be very confident in his ratings. Thus on trait rating he may show little correspondence, but on confidence rating he may show greater correspondence of inference. This conceptual independence of the two operational measures may cause problems for investigators in this area, but correspondence theory (7) does not deal explicitly with this problem. However, several investigators (2) consider confidence ratings as a more direct measure of correspondence than trait ratings. It is plausible to

argue that through confidence ratings, the Ss themselves reveal their correspondence of inference. The trait ratings, however, can only be considered as an indirect indication of Ss' correspondence of inference because it is the experimenter who interprets an increase in extremity of rating as indicating an increase in the level of correspondence.

In conclusion it may be stated that future studies may address themselves to resolve some of the methodological and conceptual issues raised above in connection with the correspondent inference theory. Besides, the theory needs to be extended to include the influence of such variables as "credibility effect" and "face engagements." Though praising is a highly socially desirable act in our culture and is, therefore, practised by the majority of people, it is nevertheless more readily accepted by the perceivers as truly reflecting their self-image and, thereby, increases the correspondence of inference in attributing favorable dispositions to the initiator of praise. Likewise, the direct manner of social interaction may represent in-role behavior, but it also provides additional nonverbal cues to the perceivers for making inferences about others who interact with them. The present results strongly suggest that correspondence theory (7) should be expanded to include the effect of nonverbal communication on the attribution process.

REFERENCES

1. ANDERSON, N. H. Likableness ratings of 555 personality-trait words. *J. Personal. & Soc. Psychol.*, 1968, **9**, 272-279.
2. DE CHARMS, R. *Personal Causation*. New York: Academic Press, 1968.
3. DEUTSCH, M., & SOLOMON, L. Reactions to evaluations by others as influenced by self-evaluations. *Sociometry*, 1959, **22**, 93-112.
4. GOFFMAN, I. *Behavior in Public Places*. New York: Free Press, 1963.
5. HUNTER, I. M. L. The solving of five-letter anagram problems. *Brit. J. Psychol.*, 1959, **50**, 193-206.
6. JONES, E. E. *Ingratiation*. New York: Appleton, 1964.
7. JONES, E. E., & DAVIS, K. E. From acts to dispositions. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 2). New York: Academic Press, 1965. Pp. 219-266.
8. JONES, E. E., & DE CHARMS, R. Changes in social perception as a function of the personal relevance of behavior. *Sociometry*, 1957, **20**, 75-85.
9. JONES, E. E., & HARRIS, V. A. The attribution of attitudes. *J. Exper. Soc. Psychol.*, 1967, **3**, 1-24.
10. JONES, E. E., DAVIS, K. E., & GERGEN, K. H. Role-playing variations and their informational value for person perception. *J. Abn. & Soc. Psychol.*, 1961, **63**, 302-310.

Faculty of Management
McGill University
P. O. Box 6070
Montreal, Quebec, Canada H3A 3G1

THE RELATION OF ATTENTION TO SOCIAL CUE DISCRIMINATION, ACHIEVEMENT, AND ADJUSTMENT IN THE ELEMENTARY SCHOOL CLASSROOM*¹

Eastern Michigan University

RICHARD M. LERNER,² RICHARD J. RINI, AND HENRY ORLOFF

SUMMARY

Sixty-one children, selected from two sixth grade classes of a semirural southeastern Michigan school, served as subjects in a study assessing the interrelations among attention, achievement, social cue discrimination ability, and school adjustment. As predicted, it was found that (a) students' attention-to-teacher and attention-to-class-activity scores were positively related to achievement, while a negative relation between attention-to-self and attention-to-peers scores and achievement was found; (b) students' scores on a test of the discrimination of the emotional content in a female's voice were also positively related to achievement; and (c) both attention scores and achievement scores were predictive of adjustment test scores. The differential interrelations of attention behaviors within the classroom environment were discussed.

A. INTRODUCTION

Studies of classroom attention have established that attention to teacher-designated objects is positively related to student achievement and *IQ* (3) and that inattending behavior is inversely related to achievement (5). These studies view classroom attention as a relatively global phenomenon and do not consider the possibility that attention alone may not suffice for adequate response to classroom situational demands. Students might also have to discriminate teachers' concomitant social cues. Support for this notion is provided in a study by Conn, Edwards, Rosenthal, and Crowne (1). Children who

* Received in the Editorial Office on January 4, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This paper is based in part on a thesis submitted by the second author in partial fulfillment of the requirements for the degree of Master of Science, Eastern Michigan University, April, 1973.

² Reprint requests should be sent to the first author at the address shown at the end of this article.

best discriminated the emotional content of an adult female's voice showed greatest response, as indexed by increments in academic performance, to teacher demands. Related research by Zoble and Lehman (8) suggests that when people do not discriminate, and concomitantly conform to such demands, they are viewed as uncooperative, as not "adjusted" to the situation.

The present study sought to integrate these findings by assessing the interrelations among various aspects of classroom attention, social cue discrimination ability, achievement, and adjustment in the elementary school classroom. On the basis of the above research, it was predicted as follows:

1. Classroom attention is a differentiated phenomenon; students can attend, for instance, to the teacher, to the teacher-designated activity, to their peers, or to themselves. These first two types of attention should be positively related to academic achievement, while the latter two types of attention should be negatively related to this achievement.

2. It is possible that attention alone is not sufficient to account for achievement. A student might attend appropriately, but if he cannot discriminate task-directing cues emitted by the teacher, then it would seem that his attention would be less than maximally useful. Accordingly, social cue discrimination ability should also be predictive of academic achievement.

3. Finally, if students are attending to teacher-designated classroom activities, are discriminating the teacher's cues effectively, and are achieving academic success, then it seems clear that such students are well meeting the social adjustment demands of the classroom situation. These students should obtain high adjustment ratings.

B. METHOD

1. Subjects

The subjects were 61 students from two sixth grade classes of a semirural elementary school in southeastern Michigan in January, 1973. Ninety-three percent of the sample were white, and seven percent were black. The mean age of the 33 males was 11.8 years ($SD = .37$ years), and the mean age of the 28 females was 11.7 years ($SD = .54$ years).

2. Measures

Several measures were compiled on each child. *IQ* data were derived from school records. The Otis-Lennon Mental Ability Test-Elementary Level I was administered by the school system while students were in the third grade. These scores were not available for 15 subjects, and in these cases *IQ* was estimated through conversion of scores from other correlated variables (e. g.,

Large-Thorndike scores) by means of the usual regression equation for raw scores on the basis of conversion data supplied by Hieronymous and Stroud (2).

Academic achievement scores were derived from a composite of each student's marks for Grades 4A, 4B, 5A, 5B, and 6A; these marks were converted into a grade point average for each grade by making each A = 4, B = 3, C = 2, D = 1, and failure = 0, and then averaging these scores.

Attention was indexed through use of a teacher questionnaire. Each sixth grader had five teachers (e.g., for English, mathematics, etc.), and every teacher rated each student's attention on a five-point scale, with 5 = "always attentive" to 1 = "never attentive." The teachers used this scale to rate each student in four areas of attention: attention-to-teacher, attention-to-teacher-designated-activity, attention-to-peers, and attention-to-self.³

Cue discrimination ability was measured by means of a modification of an index devised by Levitt (4) and similar in form to other measures (1, 7). Each child was asked to discriminate different emotions expressed in an oral tape recording of an adult female speaking the same neutral statement [see Levitt (4)]. The woman speaking was a graduate student in dramatics. The subjects were asked to identify each of six emotions (joy, surprise, fear, disgust, anger, and sadness) presented in random order. Each item was separated by 30 seconds, and all emotions were presented twice in order to assess response reliability. Each emotion was presented along with four short written descriptions to match with each emotion. The vocabulary of the descriptions was supplied by the Thorndike-Barnhart Junior Dictionary (6).⁴

Adjustment was indexed through use of three sections of the Social Adjustment portion of the California Test of Personality; these three sections—Social Skills, Social Standards, and School Relations—have alternate-form reliabilities of .84, .74, and .88, respectively.

3. Procedure

A male and female experimenter entered the classroom prior to testing in order to allow the students to adapt to their presence. The five sixth grade teachers were separately given the attention rating scales at this time. The subjects were group administered the adjustment scales and were individually tested for cue discrimination ability.

³ A copy of this rating scale may be obtained from author Lerner upon request to the address shown at the end of this article. In addition, a table presenting the interteacher reliability correlations for each of the four measures of attention may be obtained.

⁴ Copies of this test may be obtained upon request to author Lerner.

C. RESULTS

1. *Attention*

Since each sixth grader had five different academic teachers who independently rated the subject on the four different types of attention, it was necessary to evaluate between-teacher rating consistencies; this was done by correlating attention ratings with each student's academic grade point average for each grade level, respectively. If a student's attention was consistently rated by all teachers, then each teacher's ratings should have correlated with academic achievement in the same way; specifically, if all teachers were reliably rating the students' attention, then attention-to-teacher and attention-to-activity ratings should be positively related to academic achievement in each grade; conversely, attention-to-peers and attention-to-self ratings should be negatively related to these academic grades.

These predictions were confirmed with 94 of the 100 correlations that resulted from these analyses. Not only were attention-to-teacher and attention-to-activity positively related to achievement in Grade 6A, and attention-to-self and attention-to-peers negatively related to mean achievement in Grade 6A, but these relations obtained separately with each of the five independent teacher's ratings. Moreover, even though the teachers' attention ratings might have been confounded with the grade they gave each student in Grade 6A, there was no confounding of grades from earlier levels and sixth grade teachers' attention ratings. Students had different teachers in these earlier grades. Yet, in 96% of these cases the same pattern of relation was found. Because of this marked consistency, student attention ratings were collapsed across teachers, and the resulting relations between these collapsed scores and mean academic achievement in each grade level (which of course take the same form as the uncollapsed attention/achievement relations) are summarized in Table 1. When sex and *IQ* were separately partialled out of each of the attention/achievement relations, no significant decreases in the level of relation between these variables were obtained.

The pattern of relations between adjustment and attention measures was similar to that obtained between achievement and attention. All three adjustment measures were positively related to attention-to-teacher and attention-to-activity scores, while these measures were all negatively related to attention-to-peers and attention-to-self scores. These relations are summarized in Table 2.

When the effects of sex and *IQ* were partialled out of these relations, 75% of the correlations maintained similar levels of significance in the case of sex, while in the case of *IQ* 83% of the relations remained similar.

TABLE 1
RELATION OF ATTENTION RATINGS AND ADJUSTMENT MEASURES IN THE SIXTH GRADE
TO MEAN ACADEMIC ACHIEVEMENT IN GRADES 4A, 4B, 5A, 5B, AND 6A

Measure	Grade level				
	4A	4B	5A	5B	6A
Attention to					.81**
Teacher	.45**	.51**	.62**	.67**	.80**
Activity	.48**	.55**	.69**	.70**	.47**
Peers	-.27*	-.41**	-.43**	-.51**	-.76**
Self	-.34**	-.49**	-.56**	-.59**	
Adjustment					.43**
Social Skills	.21	.24	.42**	.39**	.36**
School Relations	.19	.18	.30*	.30*	

* $p < .05$.** $p < .01$.

2. Cue Discrimination

The correlation between subjects' total scores for the cue discrimination test and the retest for this measure was .72 ($df = 59$, $p < .01$). Because of this level of reliability, and because the mean scores for the test (5.1, $SD = .94$) and retest (5.1, $SD = .93$) were not significantly different, the scores for each of these two assessments were combined for each subject to form a total cue discrimination score. Total cue discrimination scores predicted Grade 6A achievement scores ($r = .30$, $df = 59$, $p < .05$), but when the effects of IQ were partialled out of this relation, the correlation was decreased (partial $r = .23$, $p < .10$). Similarly, these scores were found to have a low, positive relation to achievement scores in the other grade levels, although in only two of the four cases did the correlation reach an acceptable level of significance.

TABLE 2
RELATION OF ATTENTION RATINGS TO THREE MEASURES OF ADJUSTMENT:
SOCIAL STANDARDS, SOCIAL SKILLS, AND SCHOOL RELATIONS

Attention dimension	Adjustment measure		
	Social Standards	Social Skills	School Relations
Attention to			.30*
Teacher	.33**	.43**	.23
Activity	.20	.31*	-.35**
Peers	-.14	-.39**	-.32*
Self	-.23	-.33**	

* $p < .05$.** $p < .01$.

3. *Adjustment*

The pattern of relations of adjustment to achievement was similar to that found between attention and achievement. Although no significant relations between Social Standards adjustment and achievement were found in any grade, Social Skills adjustment and School Relations adjustment were significantly related to achievement in Grades 5A, 5B, and 6A. Nonsignificant relations of similar direction were obtained between these two adjustment measures and achievement in the fourth grades. These relations are summarized in Table 1. When sex is partialled out of these relations, similar levels of relation and significance are maintained.

D. DISCUSSION

The first hypothesis of this study was that attention would predict achievement. This prediction was clearly confirmed at all assessed grade levels. Moreover, these relations were maintained even when the effects of sex and *IQ* were separately partialled out of these relations. The present results indicate that attention can be reliably divided into different dimensions, and that these types of attention are significantly related to achievement (and adjustment) in predicted directions.

The second hypothesis tested was that cue discrimination would also be positively related to achievement. The significant correlation between total cue discrimination scores and Grade 6A grade point averages was consistent with this hypothesis. But this relation was low and was further decreased when the effects of *IQ* were partialled out of the relation. The failure of cue discrimination to correlate more highly with achievement may be attributable to several sources (e. g., the relatively restricted variability of the cue discrimination scores). In addition, the format of elementary school instruction might be a source of the present finding. One might expect teachers to be fairly clear in cueing their instructions at this grade level. Thus, few if any students would be expected to be unable to discriminate teachers' instructions on the basis of such cues. By contrast, one might speculate that social cue discrimination would correlate more highly with achievement in other types of classroom situations (e. g., in a dramatics class) where the formal, linguistic content of the verbal instructions might be only partially indicative of the total message delivered by the teacher.

Finally, both attention and achievement were predictive of adjustment. This result suggests that an inattentive student is not responding to his school environment in the correct manner, as defined by his teacher and

society. Since inattention to the appropriate classroom object means attention to inappropriate others, to some nonacademic activity, or to some self-contained inappropriate activity (e. g., daydreaming), the greater the level of this type of attention behavior the less socially conforming, and the less socially adjusted, the student is in the context of the school social environment. Thus, the product of this interrelation is a student who achieves poorly.

REFERENCES

1. CONN, L. K., EDWARDS, C. N., ROSENTHAL, R., & CROWNE, D. Emotional perception and response to teacher expectancy in elementary school children. *Psychol. Rep.*, 1968, **22**, 29-34.
2. HIERONYMOUS, A. N., & STROUD, J. B. Comparability of IQ scores on five widely used intelligence tests. *Meas. & Eval. Guid.*, 1969, **2**, 135-140.
3. LAHADERNE, H. M. Attitudinal and intellectual correlates of attention: A study of four sixth-grade classrooms. *J. Educ. Psychol.*, 1968, **59**, 320-329.
4. LEVITT, E. A. The relationship between abilities to express emotional meanings vocally and facially. In J. R. Davitz (Ed.), *The Communication of Emotional Meaning*. New York: McGraw-Hill, 1964. Pp. 82-100.
5. MORSH, J. E. Systematic observation of instructor behavior. Development report No. AFPTRC-TN-56-52, USAF Personnel Training Research Center, Washington, D.C., 1956.
6. THORNDIKE, E., & BARNHART, C. Thorndike-Barnhart Junior Dictionary. Chicago: Scott, Foresman, 1965.
7. WILLIAMS, F., & SUNDENE, B. Dimensions of recognition: Visual vs. vocal expression of emotion. *Audio Vis. Commun. Rev.*, 1965, **13**, 44-52.
8. ZOBLE, E. J., & LEHMAN, R. S. Interaction of subject and experimenter expectancy effects in a tone length discrimination task. *Behav. Sci.*, 1969, **14**, 357-363.

Department of Psychology
 Eastern Michigan University
 Ypsilanti, Michigan 48197

RACE, COMPETENCY, AND LEVEL OF ACHIEVEMENT: RELATIONSHIP TO MODELING IN ELEMENTARY SCHOOL CHILDREN*

New York Institute of Technology and Hofstra University

RAYMOND J. HAVELICK, JR., AND JULIA R. VANE

SUMMARY

White and Negro boys observed white and Negro female models under two conditions of competency. Results showed that the high competency model was imitated significantly more than the low competency model, but the amount of modeling across all conditions was low. Ss with school records of below average achievement modeled significantly more than Ss with records of average or above average achievement. Questioning revealed that Ss correctly perceived the competency of the models. White Ss rated Negro and white models equally competent. Negro Ss rated the Negro model as significantly more competent, but imitated the white model significantly more. Prediction that Ss of the same race as the model would imitate more than Ss of a race different from the model was not confirmed.

A. INTRODUCTION

In recent years, the role of imitation or modeling as an important mechanism in the transmission of behavior patterns has received increasing attention. Educators have suggested that it is important to have male and female teachers of different races in order to provide a variety of models for children from different backgrounds. The purpose of the present study was to evaluate the effects of the race and competency of a model upon the imitative behavior of fifth and sixth grade white and black American children.

Imitation or modeling has been defined by Flanders (5) as occurring when the observation of the behavior of the model affects the observer so that the observer's subsequent behavior becomes more similar to the observed behavior of the model. Studies involving characteristics of the model have shown that models who are successful (11), who have prestige (16), who exhibit warmth (1), who are aggressive (2), who are competent (6), who

* Received in the Editorial Office on January 7, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

exhibit power (12), who are dominant (7), who are experienced (9) elicit more imitation than models who display traits in contrast to those mentioned.

Other studies have shown that such characteristics as dependency (19), cooperation and competitiveness (15), self-esteem (6), emotional disturbance (8), prior history of success or failure (18), and socioeconomic and racial status (4) significantly influence the tendency to model.

Studies of the interaction between model and observer have indicated that perceived similarity between model and observer is an important enhancer of imitation in many, but not in all, situations (16). Observer and model characteristics that interact to enhance or diminish modeling are age (13), sex (3), and ethnic status (13).

B. PROCEDURE

The present study utilized two model variables, race and competency, and two observer variables, race and previous history of success or failure as measured by past achievement of the children. There were 95 white and 93 black fifth and sixth grade boys assigned to one of four modeling conditions: white low competency model; white high competency model; black low competency model; black high competency model. In the low competency condition the model was correct from zero to 33% of the time. In the high competency condition, the model was correct from 75% to 100% of the time.

The procedure involved having a child seated in a classroom facing a blackboard and a table on which there was the apparatus which consisted of one yellow, one blue, and one red light. The lights were activated by remote control by the experimenter in back of the room. On the blackboard there were three colored circles, and each child was given a paper on which there were three similar circles and five lines on which the child could indicate his response. Once the child was seated, the experimenter gave him the instructions:

... teacher will come in and play a game with these lights. The colored lights go with the colored circles on your paper. The teacher will draw an X under the colored circle to show which light she thinks will go on ...

At this point the teacher entered and was asked if she was ready. Trial 1 was announced, and the teacher made her choice by marking an X on the blackboard under the appropriate colored circle. Each trial consisted of the teacher's choice, following which one of the lights went on. This automatically indicated whether or not the teacher had been correct. The model had memorized the list of choices for each set of patterns, which had been chosen on a random basis. Following 12 trials by the model, the child was told it was "his turn."

... You can make your guess on the answer paper just like the teacher made her guess on the blackboard. Your teacher is going to play while you're playing so be sure to see what her choice is before making your guess ... The teacher will make her mark, then you can make your mark in the answer space. When we are finished, I will tell you how well you did. You may mark any circle you want. It does not have to be the same as the teachers. ...

Degree of imitation was defined operationally as the number of responses a child gave that were identical to those of the model. Possible imitative scores ranged from zero to 5.

After the imitation condition was completed and the model had left the room, the student was given a paper and asked to indicate how "good" he thought the teacher was at the task. On the paper was a five point scale which read: 5 (Very Good); 4 (Good); 3 (Average); 2 (Poor); 1 (Very Poor).

After the experiment was completed, data related to achievement of the students involved were collected from the classroom teachers. On the basis of these data the children were classified as below average, average, or above average achievers. There were a number of repeaters in the below average group. Because this variable was not used as the basis for assignment to the four different groups, an unequal number of children with different achievement levels were in each modeling condition.

C. RESULTS

The results showed that the overall amount of imitation was low, with a mean across all conditions of only 1.85 out of a possible 5.00. This indicates that although it was possible for the subjects to imitate 100% of the time, they did so only 37% of the time. The high competent model was imitated significantly more often (mean = 2.17 or 43%) than the low competent model (mean = 1.57 or 32%); and the below average achievement subjects modeled significantly more often (mean = 2.20 or 44%) than the average or above average subjects, who imitated only 33% of the time (mean = 1.65).

In the original design black and white children were assigned to the black and white models and to the high and low competency conditions, and achievement level was considered to be randomly distributed. A $2 \times 2 \times 2$ analysis of variance done with these 188 subjects showed a significant main effect for the competency variable ($F = 11.44$, $p < .01$), suggesting that competency was a significant factor in the modeling and was independent of the effect of race of the subject and race of the model. There were no interaction effects.

Because level of achievement of the subjects was found to be unequally distributed in relation to the other variables, a $2 \times 2 \times 2 \times 2$ analysis of variance using treatment means as single observations in order to correct for unequal numbers in the groups was carried out. This analysis indicated that there was a significant main effect with respect to the achievement of the subjects ($F = 8.88, p < .01$), with below average subjects imitating significantly more than the average or above average subjects. This effect was independent of the competency of the model and resulted in eliminating the main effect of competency because of the tendency of the below average subjects to imitate the low competent model almost as frequently as the high competent model.

In order to determine whether the limited amount of imitation demonstrated over all conditions might have been related to the failure of the subjects to note the competency of the model, the ratings by the subjects of the competency of the models was analyzed. The results showed that both the below average and average or above average subjects responded in a similar fashion and evaluated the high competency model as performing at a significantly higher level (mean = 4.35) than the low competency model (mean = 2.44). A $2 \times 2 \times 2 \times 2$ analysis of variance with correction for unequal groups indicated a significant main effect for evaluation of competency of the model ($F = 231.11, p < .01$) and a significant interaction effect with respect to race of the subject and race of the model. The white subjects rated both the black and white models as equally competent, but the black subjects rated the black model as significantly more competent than the white model. Despite this, the black subjects imitated the white model significantly more often (.05 level) than they did the black model.

D. DISCUSSION

The results with respect to the greater amount of modeling on the part of children with below average ability are in keeping with results from other studies that have shown that a history of failure is a predisposing factor in modeling. The fact that the majority of the students did not imitate either the high or low competent model, although the relative competency of the models was clearly perceived by them, suggests the complexity of the modeling process. This is highlighted by the fact that the black children in this study rated the black model significantly more competent than the white model, but imitated the white model somewhat more frequently (mean = 2.33) than the black model (mean = 1.66).

When the children who did not model were asked after the experiment why they didn't follow what the teacher did, they replied with such comments

as, "I wanted to try it my way," "It's not right to copy," "You're supposed to work on your own." These comments and the failure of the majority of the students to model are consonant with results from a study by Luchins and Luchins (10) who found that when sixth grade students and college students were exposed to a modeling task, there was a limited amount of modeling. They concluded (p. 194): "Our subjects' initial reluctance to repeat the overheard responses stands in contrast to the dictum that there is an innate or compulsive tendency to imitate, repeat, or mimic." Patterson, Littman, and Brown (17) found a similar reluctance to imitate on the part of first grade children and concluded that there is a "negative set" elicited that is related to the task and the characteristics of the model which tends to inhibit modeling. On the whole, it would appear that in many modeling situations one of the factors operating is a desire on the part of the observer to "try it on his own" and a reluctance to model lest it be construed as "copying" or "cheating." The fact that most schools verbally tend to reinforce independent thinking and discourage copying suggests that the children have learned this and, when there is no strong reason to model, will tend to respond in terms of these principles.

The results in general suggest that past history of failure in the subject is a stronger variable than competency of the model and that race of the model *vis-à-vis* race of the subject is a less important variable than either competency of the model or subject's past history of failure. Further study is needed to determine what factors would induce children to overcome their set against copying and independent action and show a higher degree of modeling.

REFERENCES

1. BANDURA, A., & HUSTON, A. C. Identification as a process of incidental learning. *J. Abn. & Soc. Psychol.*, 1961, **63**, 311-318.
2. BANDURA, A., ROSS, D., & ROSS, S. Transmission of aggression through imitation of aggressive models. *J. Abn. & Soc. Psychol.*, 1961, **63**, 575-582.
3. ———. Imitation of film mediated models. *J. Abn. & Soc. Psychol.*, 1963, **66**, 3-11.
4. BEYER, N. L., & MAY, J. G. The effects of sex and race of the observer and model on imitation learning. *Psychol. Rep.*, 1970, **27**, 639.
5. FLANDERS, J. P. A review of research on imitative behavior. *Psychol. Bull.*, 1968, **69**, 316-337.
6. GELFAND, D. M. The influence of self-esteem on rate of verbal conditioning and social matching behavior. *J. Abn. & Soc. Psychol.*, 1962, **65**, 259-265.
7. HEATHERINGTON, E. M., & FRANKIE, G. The effects of parental dominance, warmth and conflict on imitation in children. *J. Personal. & Soc. Psychol.*, 1967, **6**, 119-125.
8. LECKERMAN, L., & LYNCH, D. J. The effects of model reinforcement on emotionally disturbed boys. *J. Clin. Psychol.*, 1970, **26**, 545-547.

9. LIEBERT, R. M., & ALLEN, M. K. Effects of a model's experience on children's imitation. *Psychon. Sci.*, 1969, **14**, 198.
10. LUCHINS, A. S., & LUCHINS, E. H. Imitation by rote and by understanding. *J. Soc. Psychol.*, 1961, **54**, 175-197.
11. MAUSNER, B. The effect of one partner's success in a relevant task on the interaction of observer pairs. *J. Abn. & Soc. Psychol.*, 1954, **49**, 65-68.
12. MISCHELL, W., & GRUSEC, J. Determinants of the rehearsal and transmission of neutral aversive behaviors. *J. Personal. & Soc. Psychol.*, 1966, **3**, 197-205.
13. NICHOLAS, K. B., MCCARTER, R. E., & HECKEL, R. V. The effects of race and sex on the imitation of television models. *J. Soc. Psychol.*, 1971, **85**, 315-316.
14. ———. Imitation of adult and peer television models by white and Negro children. *J. Soc. Psychol.*, 1971, **85**, 317-318.
15. O'CONNELL, E. J., JR. The effects of cooperative and competitive set on the learning of imitation and non-imitation. *J. Exper. & Soc. Psychol.*, 1965, **1**, 172-183.
16. PATEL, A. S., & GORDON, J. E. Some personal and situational determinants of yielding to influence. *J. Abn. & Soc. Psychol.*, 1960, **61**, 411-418.
17. PATTERSON, G. B., LITTMAN, I., & BROWN, T. R. Negative set and social learning. *J. Personal. & Soc. Psychol.*, 1968, **8**, 109-115.
18. ROSENBAUM, M. E., CHALMERS, D. K., & HORNE, W. C. Effects of success and failure and the competence of the model on the acquisition and reversal of matching behavior. *J. of Psychol.*, 1962, **54**, 251-258.
19. ROSS, D. Relationship between dependency, intentional learning and incidental learning in preschool children. *J. Personal. & Soc. Psychol.*, 1966, **4**, 374-381.

Division of Continuing Education
New York Institute of Technology
Wheatley Road
Old Westbury, New York 11568

THE EFFECTS OF THE FEMALE-BASED FAMILY AND BIRTH ORDER ON THE ABILITY TO SELF-DISCLOSE*

The Ohio State University

E. LAMONTE OHLSON

SUMMARY

By means of a $2 \times 2 \times 4$ way analysis of variance, modified when needed, the self-disclosing ability (as measured by the Jourard Self-Disclosure Questionnaire) of freshman college students from divorce and nondivorce homes was analyzed. The results of the study provide evidence that, generally, a person from a female-based home of the divorce type does not disclose the self any more or any less than a person from a nondivorce home situation. Also, the father does not play a major role in determining or directing the self-disclosure process of his children.

A. INTRODUCTION

Jourard and Lasakow (10) have developed a questionnaire for assessing the index of a relationship or the amount of self-disclosure—affection, love, or trust—between two people (7). Researchers who have used this instrument have extended its use in attempting to study the relationship between an individual's self-disclosing ability and his neurosis (12), group influences (4), and self-introduction (5). Further research dealing with the relationship between self-disclosure and self-esteem, "dyadic effect," and birth order has been conducted by such investigators as Fitzgerald (2), Jourard and Landsman (9), and Munz and Diamond (11), respectively.

Although it is not uncommon to discover ambiguities and conflicts in present research findings, the problem exists in the conclusiveness of the findings. Therefore, the present study not only sought to extend the use of the Jourard and Lasakow Self-Disclosure Questionnaire, in attempting better to understand the child who is a product of a broken home, but at the same time, to analyze further the birth order and sex variables as they relate to self-disclosure. Thusly, the research problem is this: To what extent do

* Received in the Editorial Office on January 24, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

sex, birth order, and length of divorce influence a person's ability to self-disclose to some target person?

B. METHOD

1. Subjects

Because of the unavailability of a large enough population to meet the criteria of the independent variable, the entire population of 90 freshman students from a female-based home was used. The 90 students (University of Oklahoma) consisted of 43 males and 47 females with a combined mean age of 18.12 years ($SD = .5046$ years). Another 90 freshman college students (University of Oklahoma) from intact families were randomly selected from the remaining freshman student body ($N = 5000$). This sample was composed of 36 males and 54 females with a combined mean age of 18.11 years ($SD = .5044$ years).

2. Instruments

The Jourard and Lasakow (10) Self-Disclosure Questionnaire was employed to measure the relevant variables. The test was designed to measure the extent to which individuals self-disclose to different target persons (mother, father, female friend, male friend, and spouse) in six areas of interest involving (a) attitudes, tastes, and work (all considered nontaboo subjects); and (b) money, personality, and body (all considered taboo subjects).

Each subject rated 60 questions in the following terms: 0 = no self disclosure; 1 = a general amount of self-disclosure; 2 = complete self-disclosure; and X = misrepresentation. In addition to the score for specific target persons, the questionnaire scale provides an overall disclosure score which is simply the sum of the entire 60 questions.

Previous research with the instrument (8) showed an odd-even reliability coefficient of $r = .93$ for the total score. Former Jourard studies (6, 7, 8), which dealt with self-disclosure and college grades, have sequentially established construct, concurrent, and some measure of predictive validity for the instrument.

In addition to Jourard's questionnaire, a preliminary questionnaire was used to gather data about the status of the subjects' families. The data gathered determined the subject's sex, age, parental status, birth order, and length of divorce experienced by the family.

3. Procedure

Three analyses of variance were computed, modified to accommodate the unequal cell frequencies, repeated measures, and a nested variable: (a) 2

(divorce *vs.* nondivorce) \times 2 (birth order) \times 4 (target person); (b) 2 (sex) \times 2 (birth order) \times 4 (target person); (c) 2 (sex) \times 3 (divorce level) \times 4 (target person). However, since an analysis of variance only has the ability to determine whether or not a statistically significant difference occurred within the comparison as a whole, a modified orthogonal analysis was necessary to determine wherein the differences existed. At the same time, since some of the main effects were not significant, but one of their interaction effects was, a test for simple effects was employed to determine the whereabouts of the interactions. The data from the Jourard and Lasakow Self-Disclosure Questionnaire were then analyzed.

C. RESULTS

The first step in analyzing the data involved the construction of a matrix which revealed the overall frequency distribution and the means of the Jourard questionnaire disclosure scores. Total disclosure was greater for the nondivorce group than for the divorce group, and their respective means were proportional to this standing. With use of the raw data¹ appropriate *F* tests were used to determine significant differences and interaction effects.

1. Divorce Group *vs.* Nondivorce Group Combined

The marital status main effect, which sought to determine if a difference existed in total amount of self-disclosure between the two samples (divorce/nondivorce), was statistically significant ($F = 10.65$, 1 *df*, $p < .01$). In order to delimit the specific area wherein the differences lay, a further analysis of variance was computed on the remaining effect variables: sex, birth order, and target person. A modified orthogonal analysis was also computed over the marital status main effect to determine if differences existed between the divorce *vs.* nondivorce groups in the target person variables: mother, father, male friend, and female friend.

Comparison of the amount of self-disclosure projected toward the mother target person of the divorce group *vs.* the nondivorce group (see Table 1) resulted in a nonsignificant *F* ratio ($F = .74$, 1 *df*, n.s.). On the other hand a highly significant *F* ratio ($F = 15.23$, 1 *df*, $p < .01$) resulted when both groups were contrasted in terms of self-disclosure toward the father target person. The greater amount of self-disclosure toward the father prevailed within the nondivorced home. The differences did, therefore, add to the significance of the overall marital status main effect.

¹ Summary charts of the raw data, consisting of \bar{X} s and *SD*s, are available from the author upon request to the address shown at the end of this article.

In the comparison of the amount of self-disclosure in both groups toward a male friend, a highly significant F ratio was found ($F = 98.37$, 1 df , $p = < .01$). The respective means of each group (see Table 1) show that the greater amount of self-disclosure toward the male friend was found within the nondivorce home. Of course, the differences were overall, and it could not be determined whether or not they were due to sex or birth order.

When total disclosure scores toward the female friend target person of both groups were contrasted, a highly significant F ratio was obtained ($F = 98.08$, 1 df , $p = < .01$). Again, the respective means of each group show that greater total self-disclosure toward the female friend existed within the non-divorced home, irrespective of birth order and sex. The differences between the amounts of self-disclosure did, therefore, contribute to the significance of the overall marital status main effect.

No statistically significant differences were found within the sex variable of both groups in terms of the amount of self-disclosure projected toward the target person variable ($F = 1.39$, 1 df , n.s.). Also, no statistically significant differences were found in the amount of self-disclosure between the birth orders of the divorce and nondivorce families combined ($F = .051$, 1 df , n.s.). Any differences that were present between the birth order variable of both groups and between the sex variable of both groups had not contributed to the overall significant F ratio of the marital status main effect.

Similarly, statistically significant differences were not found in the amount of self-disclosure among the four categories of the target person variable for the divorce *vs.* nondivorce group combined ($F = 1.05$, 3 df , n.s.). What differences had occurred had not, in any way, accounted for the overall marital status main effect difference.

Because the remaining analysis of variance upon the main effects found that sex, birth order, and/or target person were not significant enough to add to the marital status main effect statistically significant difference, a modified orthogonal analysis was employed to find wherein the marital status main effect differences lay. Said analysis reported differences within the target persons father, male friend, and female friend.

Out of all possible interaction effects of the divorce group *vs.* the nondivorce group combined, only one first order interaction (birth order) was found significant ($F = 4.46$, 1 df , $p = < .01$). A significant interaction meant, therefore, that the nonsignificant birth order main effect had to be qualified. A modified orthogonal analysis was run to see if the differences lay within the combined birth orders of each group. A test of simple effects was also utilized to see if the differences between firstborns (B_1) and later borns (B_2)

of the divorce group, and between B_1 and B_2 Ss of the nondivorce group, were eminent.

Testing for simple effects resulted in statistically significant F ratios between B_1 and B_2 Ss of the divorce group ($F = 11.49, 1 df, p = < .01$) and between B_1 and B_2 Ss of the nondivorce group ($F = 96.94, 1 df, p = < .01$). It was then concluded that the nonsignificant birth order main effect should be ignored because differences were revealed. In the nondivorce group, B_2 Ss had disclosed more than B_1 Ss. Conversely, in the divorce group, B_1 Ss had disclosed more than B_2 Ss.

The contrast between B_1 of the divorce group and B_1 of the nondivorce group resulted in a nonsignificant F ratio ($F = 2.77, 1 df, n.s.$). However, a significant F ratio ($F = 49.51, 1 df, p < .01$) between the two groups for B_2 was found. The difference between the B_2 Ss, of course, supplied more evidence to back up the occurrence of difference in self-disclosure of the B_2 Ss of the divorce group and nondivorce group individually. No other statistically significant higher order interactions among the variables of sex, target person, and birth order of the divorce *vs.* nondivorce group combined were found.

2. Nondivorce Group

For the three main effects of the nondivorce group, statistically nonsignificant F ratios were found. Therefore, the assumption that no difference between total self-disclosure scores of males and females, B_1 and B_2 Ss, and target persons was tenable ($F = .02, 1 df, n.s.$; $F = 3.21, 1 df, n.s.$; and $F = .076, 3 df, n.s.$).

In terms of total self-disclosure of Ss from nondivorce homes, nonsignificant interactions were found between sex and birth order, sex and target person, and birth order and target person ($F = 1.04, 1 df, n.s.$; $F = .043, 3 df, n.s.$; $F = .007, 3 df, n.s.$). An analysis of variance over sex, birth order, and target person for third order interaction in terms of total self-disclosure for the nondivorce group resulted in a nonsignificant F ratio ($F = .01, 3 df, n.s.$), and no significant differences were reported.

3. Divorce Group

In tests for statistically significant differences in the ability to self-disclose between male and female Ss from the divorce group, a nonsignificant F ratio was attained ($F = 1.44, 1 df, n.s.$). This particular position added further evidence to collaborate the nonsignificant F ratio for the sex variable main effect of the divorce *vs.* nondivorce comparison.

There was evidence of sex differences in the divorce group through an association with the target person self-disclosure scores ($F = 2.80, 3 df, p < .01$). Within the first order interaction there existed a difference in the amount of the total self-disclosure among the target person variable according to the sex of the Ss. A modified orthogonal contrast showed that there was a difference between male and female self-disclosure scores toward a female friend ($F = 4.66, 1 df, p < .01$), and a test for simple effects showed that females disclosed more than males to a female friend ($F = 10.42, 3 df, p < .01$). The analysis produced no other significant F ratios for the sex variable.

A statistically nonsignificant difference in the ability of B_1 and B_2 Ss to self-disclose to the target person variable was produced ($F = .81, 1 df, n.s.$). The assumption that B_1 Ss disclosed as much as B_2 Ss was found tenable. A computed nonsignificant difference between the birth orders of the divorce and nondivorce groups contributed further evidence to support the nonsignificant F ratio position of the overall analysis of variance for birth order.

A statistically significant F ratio ($F = 5.72, 2 df, p < .01$) was found in the test for differences in the ability to self-disclose among Ss from various divorce length home situations. A modified orthogonal analysis was then computed over the divorce length components: one to four years of divorce (D_1); five to 10 years of divorce (D_2); 11 or more years of divorce (D_3). Comparison of D_1 with D_2 Ss resulted in a statistically nonsignificant F ratio ($F = 1.22, 1 df, n.s.$). On the other hand, when the same analysis was computed over D_1 vs. D_3 and D_2 vs. D_3 , a statistically significant difference occurred ($F = 26.83, 1 df, p < .01$). The conclusion was drawn that D_1 and D_2 Ss had self-disclosed more to the target person variable than had D_3 Ss (see Table 1 for means matrix). The problem then became one of finding where the differences existed within the target person variable. By means of a

TABLE 1
MATRIX OF MEANS OF TOTAL SELF-DISCLOSURE SCORES FOR Ss FROM
DIVORCE AND NONDIVORCE HOMES BY TARGET PERSON

Target person	Nondivorce home	Divorce homes			Mean
		D_1 (1-4 years)	D_2 (5-10 years)	D_3 (11+ years)	
Mother	66.18	60.30	66.81	51.80	60.98
Father	57.95	30.18	39.00	23.73	31.03
Male friend	65.96	63.27	65.03	61.57	63.39
Female friend	66.22	62.61	68.42	59.42	63.99
Total	256.31	216.36	239.26	196.58	219.39

modified orthogonal analysis, significant differences were found between D_2 and D_3 for the female friend target person variable ($F = 5.17, 1 \text{ df}, p < .05$). Ss of the D_2 level disclosed more to female friends than Ss of the D_3 level (see Table 1).

However, comparison of the four target persons of D_1 with the four target persons of D_3 resulted in statistically nonsignificant F ratios: mother ($F = 2.61, 1 \text{ df}, \text{n.s.}$); father ($F = .81, 1 \text{ df}, \text{n.s.}$); male friend ($F = .04, 1 \text{ df}, \text{n.s.}$); female friend ($F = 2.61, 1 \text{ df}, \text{n.s.}$). Therefore, even though significant differences had existed between D_1 and D_3 in terms of self-disclosure toward the target person variable, the differences existed within a combination of target person disclosure scores for both the D_1 and D_2 groups. However, paired comparisons of target person self-disclosure ability scores were beyond the scope of the analysis, and further computations were not required.

For the target person main effect a statistically significant F ratio existed ($F = 8.42, 3 \text{ df}, p < .01$). Therefore, the assumption that there was as much self-disclosure of Ss from the divorce group toward mother, father, male friend, and female friend was not found tenable. It was also apparent that what occurred in the divorce home concerning target person disclosure had not occurred within target person self-disclosure of the nondivorce home. Again a modified orthogonal analysis was computed to determine wherein the target person differences existed.

The resulting F ratios for the contrasts within the divorce group of target person mother *vs.* male friend and female friend, and male friend *vs.* female friend, netted statistically nonsignificant differences ($F = .14, 1 \text{ df}, \text{n.s.}$; $F = .002, 1 \text{ df}, \text{n.s.}$; $F = .18, 1 \text{ df}, \text{n.s.}$). The assumption was then made that there were no differences in the amount of self-disclosure produced by Ss of the divorce group to target persons mother, male friend, and female friend. However, this occurrence was not tenable for the amount of self-disclosure projected toward the father. Through inspection of the means of self-disclosure scores for the target person variable of the divorce group (see Table 1) the differences were readily recognized. The amount of self-disclosure toward the father was lower than toward the other target persons: mother *vs.* father ($F = 23.10, 1 \text{ df}, p < .01$); father *vs.* male friend ($F = 26.83, 1 \text{ df}, p < .01$); father *vs.* female friend ($F = 22.65, 1 \text{ df}, p < .01$).

Appropriate analysis over the variables of higher order interaction resulted in statistically nonsignificant F ratios for all but one effect. The statistically significant interaction of sex \times target person was reported under the sex main effect.

D. DISCUSSION

As previously stated, the analysis of variance over the divorce group *vs.* the nondivorce group combined produced a nonsignificant *F* ratio. It was, therefore, concluded that the amount of self-disclosure for the 180 freshman college students did not significantly differ in amount given to each target person. The same result was also found tenable for the nondivorce group analysis. However, the phenomenon did not hold true for the divorce group. The amount of self-disclosure projected by the 90 subjects of the divorce group was of a lesser amount toward the father. Needless to say, the absence of the father was the primary reason. Of principal interest is that the amount of self-disclosure generally given to the father was not distributed among the remaining target persons; nor was the excess added to any one specific target person's score. One would have assumed that the absence of the father would seemingly establish a closer bond between the child and another individual, regardless of whether or not the bond was in the form of an oedipal attachment, sex role identification, peer group association, and the like. However, to make such an assumption would be purely speculative.

All that can be said concerning the differences in amount of self-disclosure toward the target person variable of the divorce group is that upon and after the departure of the father, the amount of self-disclosure, or the degree of closeness held by the student with another target person, was not altered. Within a divorce home situation, and for reasons unknown to the present study, the position once held by the father is and was of no consequence to the amount of disclosure projected upon other target persons.

The second assumption made was that the amount of self-disclosure would be the same for males and females. The assumption was found tenable for the overall analysis and for the nondivorce group analysis; but it was not found tenable for the divorce group analysis because a significant sex \times target person interaction was netted. Further analysis more accurately showed that the female Ss were disclosing more to a female friend than were males. The difference did not necessarily mean that the absence of the father altered the males' ability to self-disclose to a female friend; nor can it be assumed that the absence of the father hampered the Ss' ability to relate to other individuals. If Alcorn's (1) hypothesis is still valid, there should have resulted a significant interaction effect between males and females of the divorce home *vs.* males and females of nondivorce home. More realistically, females disclosed more to a female because it was easier for a female to make the transition from mother relatedness to female friend relatedness. On the other hand, it

cannot be expected that with the absence of the father, the ties between a mother and son become stronger, therefore, expecting the male to seek female companionship in the same degree of strength with a female friend. If this were the case, males of the divorce home would be relating a greater amount to the mother than would males of the nondivorce home. Again, this was not the case.

In the final analysis of the birth order variable it was found that an S's relative birth order played an integral part in his self-disclosing ability. That is, later borns were disclosing more about the self than were firstborns, providing they were from a nondivorce home situation. However, the reverse position was found tenable for the divorce group [a position contrary to the Munz and Diamond (11) study].

Reasons for the latter occurrence are many. In disclosing more, the B_1 Ss displayed a lesser degree of fear, guilt, and withdrawal. Undoubtedly B_1 Ss are able to accept the divorce situation more readily and are more socially dexterous than B_2 Ss. On the other hand, B_2 Ss seemingly are unable to accept the divorce situation and fear that their world is disrupted. Coupled with this disorientation and fear is the feeling that one had lost love, affection, and trust. A similar position is held by Jourard and Lasakow (10). The cumulative effect is the inability of the B_2 student to establish any degree of closeness to other individuals wherein the self is revealed.

The fourth main effect assumption predicted there would be no differences in the amount of self-disclosure for those subjects who came from a home broken by divorce of one to four years, five to 10 years, and 11 or more years. The assumption was not found tenable because D_1 and D_2 groups were disclosing more about the self to the four target persons than was the D_3 group. However, the differences between D_1 and D_3 were not dependent upon individual target person disclosure scores, but most likely upon a combination of scores. Within a combination of the target person variable the S from the shorter divorce length home was probably more upset by the divorce and was, therefore, seeking a combination of people to whom to disclose. If the combination was with male friend and female friend, the child probably resented his mother and father and, therefore, sought two people to replace them. However, this explanation is purely speculative, for an analysis was not set up to see if paired comparisons were significant.

On the other hand, the differences between the D_2 group and the D_3 group existed within the female target person variable. D_3 Ss were disclosing less than D_2 subjects. The reasoning behind this occurrence rests within two areas: (a) acceptance of the divorce situation; or (b) fear, guilt, and with-

drawal. In reference to the former area, the Ss from a home broken by divorce for 11 or more years might have had sufficient time to gain social independence and, therefore, did not need to confide in a female friend.

Another and more stressful reason for the lesser amount of self-disclosure toward a female friend rests within the area of conscious or unconscious sex role identification. In our present society we expect males to identify after males and females after females. However, in a divorce home situation the mother must assume a great many of the absent father's responsibilities, in addition to her own. As a result the subject might come to resent the mother's newly acclaimed role and shun an alliance with a female friend for fear that she, too, portrayed a dual role. The occurrence most likely had not affected the shorter divorce periods, as the student had not yet had the opportunity to recognize his mother's dual position. Too, if the shorter divorce period implied a longer marriage span, then the child had an extended opportunity to witness the roles of the mother and father and was not confused by the mother's new responsibility. Consequently, the child did not fear an alliance with a female friend.

At the same time, guilt is often associated with divorce, especially if the child was born when the divorce proceedings were about to take place. The child often feels that he is the cause of the divorce, and as a result may not, in later life, seek a female friend to whom to disclose for fear that he will again break an alliance. Therefore, in order to alleviate the problem the individual withholds as much about the self from a female friend as possible.

All that needs be reported about the remaining nonsignificant interaction effects is that the differences observed in target person disclosure scores were not dependent upon the sex, birth order, and/or length of divorce of the Ss involved.

E. CONCLUSION

The findings alter such theories as Glasser and Navarre's (3) who maintained that a child from a divorce home is unable to communicate his thoughts and feelings to other people. The present study was in direct contrast to this position and pointed out that children of the divorce home do establish a degree of closeness to certain target person individuals—even toward the absent father. And, for reasons other than inability, individuals from divorce homes do not disclose as much to female friends. The study also brought forth the idea that the father of the divorce home had never contributed a great deal to the individual's self-disclosing ability. Such a

conclusion can be drawn, as no drastic change in the remaining amounts of self-disclosure was detected upon and after the father's departure.

REFERENCES

1. ALCORN, B. K. Some psychological effects of paternal deprivation upon children from 10-15. *J. Educ. Sociol.*, 1962, **35**, 337-345.
2. FITZGERALD, M. P. Relationships between expressed self-esteem, similarity and self-disclosure. Unpublished dissertation, Fordham University, Bronx, New York, 1962.
3. GLASSER, P., & NAVARRE, E. Structural problems of the one-parent family. *J. Soc. Issues*, 1965, **21**, 98-99.
4. HIGBEE, K. L. Group influence on self-disclosure. *Psychol. Rep.*, 1973, **32**, 903-909.
5. HIMELSTEIN, P., & KIMBROUGH, W., JR. A study of self-disclosure in the classroom. *J. of Psychol.*, 1963, **55**, 437-440.
6. JOURARD, S. M. A study of self-disclosure. *Sci. Amer.*, 1958, **198**(5), 77-82.
7. ———. Self-disclosure and other cathexis. *J. Abn. & Soc. Psychol.*, 1959, **59**, 428-431.
8. ———. Religious denomination and self-disclosure. *Psychol. Rep.*, 1961, **8**, 446.
9. JOURARD, S. M., & LANDSMAN, M. J. Cognition cathexis, and the "dyadic effect" in men's self-disclosing behavior. *Merrill-Palmer Quart. Behav. & Devel.*, 1960, **6**, 178-186.
10. JOURARD, S. M., & LASAKOW, P. Some factors in self-disclosure. *J. Abn. & Soc. Psychol.*, 1958, **56**, 91-98.
11. MUNZ, D., & DIAMOND, R. Ordinal position of birth and self-disclosure in high school students. *Psychol. Rep.*, 1967, **21**, 829-833.
12. STANLEY, G., & BOWNES, A. F. Self-disclosure and neuroticism. *Psychol. Rep.*, 1966, **18**(2), 350.

College of Education
The Ohio State University
1945 North High Street
Columbus, Ohio 43210

ADOLESCENT-PREADOLESCENT DIFFERENCES IN BELIEFS AND ATTITUDES ABOUT CIGARETTE SMOKING*

Department of Psychology, University of Windsor, Canada

FRANK W. SCHNEIDER AND LORETTA A. VANMASTRIGT¹

SUMMARY

Three age groups of children (7-8-, 10-11-, and 13-14-years) were administered a questionnaire dealing with their smoking experiences and attitudes and beliefs about cigarette smoking. The results indicated that the vast majority of children recognized the harmfulness of smoking and most strongly disapproved of smoking. However, experimentation with smoking was found to increase with age, and older children expressed less negative attitudes about smoking. The effects of age were due largely to the differences between the preadolescent groups, on the one hand, and the adolescent group, on the other. In addition, a similar percentage of children in all three age groups perceived strong parental pressure against smoking; however, with increasing age, less opposition from their teachers and friends was perceived. Theories of social influence and moral development are considered in explaining the results.

A. INTRODUCTION

Evidence suggesting that smoking is detrimental to one's health (14) has generated a considerable amount of research on the social psychological aspects of smoking. The majority of investigators have focussed on the reasons underlying the development and/or maintenance of the smoking habit. For instance, two widely investigated factors include the influence of the smoking habits of significant others, such as parents and peers (e. g., 6, 17), and the personality correlates of smoking (e. g., 12, 16).

However, most research has been restricted to adolescent or adult populations: that is, to subjects at an age when smoking habits commonly develop or have already developed. For example, of the 31 primary reports dealing

* Received in the Editorial Office on January 28, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors express their appreciation to the Windsor Separate School Board for its cooperation during the execution of the study and to Larry M. Coutts and Kenneth H. Rubin for their helpful suggestions during the preparation of this paper.

with the relationship between smoking and personality reviewed by Smith (12), in only one (13) were preadolescent subjects considered. The paucity of research with children is noteworthy in view of the recognized influence of the early years on attitude and habit formation. As Salber and Abelin (10) have emphasized, there is a need "to determine at what age decisive attitudes toward smoking are formed, and what external influences are important at that age" (p. 371). Certainly, the evidence (e. g., 6, 8) that few preadolescents smoke regularly but that there is a marked increase in habitual smoking during the teens suggests the importance of considering the changes that occur during the transition from preadolescence to adolescence.

The primary purpose of the present study was to compare the attitudes and beliefs about smoking of preadolescents with those of adolescents. Essentially, the study was based on the premise that in the campaign against smoking it is imperative to obtain information pertaining to the relationship between age and critical attitudes and beliefs about smoking.

B. METHOD

1. *Subjects*

The subjects were Caucasian children enrolled in a parochial elementary school located in Windsor, Ontario, a city of 200,000 inhabitants. Almost all of the children were from lower or middle socioeconomic status homes. A questionnaire was administered to 360 children; however, data from 16 of the children were discarded because of their failure to complete the questionnaire. The final sample of 344 children was comprised of 69 male and 54 female 7-8-year-olds, 53 male and 67 female 10-11-year-olds, and 52 male and 49 female 13-14-year-olds.

2. *Questionnaire*

The questionnaire was designed to collect information from the subjects pertaining to the following areas of concern: (a) their smoking habits and the habits of significant others, (b) their beliefs about the harmfulness of smoking, (c) their attitudes toward smoking, and (d) their perception of the attitudes of significant others. The questions were designed so that they were followed by two or more alternative answers, after each of which was a small square. The subjects were instructed to check the square corresponding to the answer they chose.

3. *Procedure*

A 29-year-old male and a 21-year-old female investigator administered the questionnaire during class to groups of approximately 30 children. The male

investigator read each question twice. The children were instructed to read silently with the investigator before checking their answers. Both investigators helped to answer questions that arose. The children were assured that neither their parents nor their teachers would have access to the questionnaire data.

C. RESULTS

1. *Smoking Experiences*

Table I includes a list of four questions concerning the smoking experiences of the subjects and shows the percentage of subjects in each age group who reported having each of the experiences. Chi square analyses indicated that the only significant difference between the 7-8- and 10-11-year groups was that the older children were more likely to have smoked at some time ($\chi^2 = 6.76, p < .01$).² However, 13-14-year-olds did report more experience than the 7-8- and 10-11-year-olds on each of the smoking criteria: had a puff ($\chi^2 = 22.62, p < .001$ and $\chi^2 = 21.80, p < .001$, respectively); smoked a whole cigarette ($\chi^2 = 72.49, p < .001$ and $\chi^2 = 39.98, p < .001$, respectively); smoked in the past month ($\chi^2 = 38.03, p < .001$ and $\chi^2 = 23.69, p < .001$, respectively); and smoked in the past week ($\chi^2 = 22.79, p < .001$ and $\chi^2 = 17.11, p < .001$, respectively).

Analyses of sex differences within each age group revealed no significant differences among the youngest group on any of the criteria. However, among the 10-11-year-olds, boys were more likely than girls to have had a puff (69 percent *versus* 39 percent; $\chi^2 = 10.19, p < .01$) and to have smoked a whole cigarette (25 percent *versus* 9 percent; $\chi^2 = 4.28, p < .05$); while among the 13-14-year-olds, boys were more likely than girls to have smoked a whole cigarette (71 percent *versus* 43 percent; $\chi^2 = 7.15, p < .01$).

There was also an association between age and the percentage of subjects who indicated that their best friend smoked. No significant difference occurred between the 7-8-year group (8.9 percent) and the 10-11-year group (10.8 percent); however, the younger groups differed significantly from the 13-14-year group in which 39.6 percent indicated that their best friend smoked ($\chi^2 = 27.60, p < .001$ and $\chi^2 = 23.25, p < .001$, respectively). Within each age group sex was not significantly associated with the percentage of best friends who smoked.³

² $df = 1$ for all of the subsequent chi squares.

³ The subjects also were asked to circle a number ranging from 0 to 10 to indicate the number of their friends who smoked. A 2×3 (Sex \times Age) analysis of variance indicated that number of friends who smoked was a function of sex ($F = 6.34, df = 1/338, p < .025$), as well as age ($F = 81.95, df = 2/338, p < .001$). Males had more friends who smoked than females, and the mean number of friends who smoked increased with age (.58, 1.59, and 5.26, respectively).

TABLE 1
SMOKING EXPERIENCES, BELIEFS, ATTITUDES, AND PERCEPTION OF ATTITUDES
OF SIGNIFICANT OTHERS BY AGE GROUP

Questions and statements	7-8 years	Age 10-11 years	13-14 years
<i>Questions about experience (percentages of children responding "yes")</i>			
Have you ever had a puff of a cigarette?	52.0 _a	52.5 _a	83.2 _b
Have you ever smoked a whole cigarette?	4.9 _a	15.8 _b	57.4 _c
Have you smoked a cigarette in the past month?	.8 _a	4.2 _a	30.7 _b
Have you smoked a cigarette in the past week?	.8 _a	2.5 _a	20.8 _b
<i>Statements of belief (percentages of children responding "true")</i>			
Smoking can cause cancer.	99.2 _a	100.0 _a	99.0 _a
Smoking shortens a person's life.	96.7 _a	99.2 _a	88.1 _b
It is very hard to stop smoking.	74.8 _a	74.2 _a	76.2 _a
Children wouldn't smoke if adults stopped smoking.	79.2 _a	75.2 _a	43.4 _b
<i>Question about attitude^a (percentages of children who chose most negative attitude)</i>			
Do you think people should smoke?	89.4 _a (5.7 _a)	87.5 _a (7.5 _a)	50.5 _b (17.8 _b)
How do you feel about smoking?	87.8 _a (4.1 _a)	71.7 _b (5.0 _a)	45.5 _c (13.9 _b)
When you become a parent, how do you think you will feel about your children smoking?	86.2 _a (7.2 _a)	80.8 _a (4.2 _a)	60.4 _b (21.8 _b)
<i>* Questions about perceived attitude^a (percentages of children who perceived others would feel "very mad")</i>			
If you were to smoke cigarettes, how do you think your:			
father would feel? ^b	64.0 _a (11.8 _a)	70.7 _a (8.6 _a)	61.6 _a (11.1 _a)
mother would feel? ^b	64.8 _{ab} (9.0 _a)	70.6 _a (7.6 _a)	53.5 _b (8.1 _a)
teacher would feel?	45.9 _a (25.4 _a)	15.0 _b (43.3 _b)	2.0 _c (60.4 _c)
good friends would feel?	27.1 _a (31.1 _a)	12.5 _b (46.7 _b)	4.0 _c (45.5 _b)

Note: Percentages within a given row not having a common subscript are significantly different from each other at the .05 level or better.

^a Figures in parentheses represent the percentage of children who responded "I don't know."

^b The number of 7-8-, 10-11-, and 13-14-year-olds who did not respond because their father was not living with them was 4, 4, and 2, respectively, and because their mother was not living with them was 1, 1, and 2, respectively.

2. Beliefs About Smoking

The children were asked to respond true or false to a series of statements of belief about smoking. The statements and results are presented in Table 1 which indicates that the children in all age groups were clearly aware of the

dangers involved in smoking. Only two out of 344 subjects responded false to the statement "Smoking can cause cancer." Also, a great majority in all three age groups agreed that "Smoking shortens a person's life," although the percentage for the 13-14-year-olds was smaller than for the 7-8- and 10-11-year-olds ($\chi^2 = 4.84, p < .05$ and $\chi^2 = 10.18, p < .01$, respectively). A similar percentage of subjects in each age group agreed that "It is very hard to stop smoking." However, the older children were less likely than the 7-8- and 10-11-year-olds to acknowledge that "Children wouldn't smoke if adults stopped smoking" ($\chi^2 = 28.20, p < .001$ and $\chi^2 = 20.98, p < .001$, respectively). For each of the statements there was a marked similarity within each age group between the percentage of boys and girls responding true.

3. Attitudes About Smoking

Table 1 also lists three questions that were designed to measure the subjects' attitudes toward smoking. For each question the subjects had to choose from among four or five alternatives which ranged from those representing extremely negative attitudes about smoking to those expressing extremely favorable attitudes. In addition, an "I don't know" alternative was provided. On all items, very few subjects expressed a positive attitude toward smoking, with the majority selecting the answer that reflected the most negative attitude.⁴ That is, most of the children responded on the first item, "Definitely no"; on the second item, "It is very bad for you"; and on the third item, "I will definitely not want my children to smoke." In order for the investigators to perform chi squares, the subjects' responses were grouped into two categories: (a) most negative and (b) those ranging from moderately negative to extremely positive, including "I don't know." The results in Table 1 show that the children's responses, although predominantly negative, became more tolerant of smoking with increasing age. A smaller percentage of subjects in the 13-14-year group was especially negative about smoking than in the 7-8- and 10-11-year groups for the first item ($\chi^2 = 39.69, p < .001$ and $\chi^2 = 34.41, p < .001$, respectively); second item ($\chi^2 = 46.10, p < .001$ and $\chi^2 = 14.49, p < .001$, respectively); and third item ($\chi^2 = 18.10, p < .001$ and $\chi^2 = 10.26, p < .01$, respectively). In addition, the 7-8-year-olds expressed a more negative feeling than the 10-11-year-olds on the second item ($\chi^2 = 8.85, p < .01$). The only sex difference occurred in the 10-11-year group in

⁴ For each item, among the subjects not expressing the most unfavorable attitude, nearly all chose either the moderately negative alternative or "I don't know." The number of 7-8-, 10-11-, and 13-14-year-olds who chose either a moderately positive or very positive alternative was as follows: Item 1: 2, 1, and 8, respectively; Item 2: 1, 0, and 1, respectively; Item 3: 0, 2, and 0, respectively.

which on the second item males were more likely to express negative attitudes toward smoking than females (83 percent *versus* 62.7 percent; $\chi^2 = 5.07, p < .05$).

The figures in parentheses also suggest that a larger percentage of the oldest subjects chose the "I don't know" alternative on each of the items, thus manifesting more personal uncertainty about their attitudes. There were no significant differences between the 7-8- and 10-11-year-olds in their tendency to reply "I don't know," but they differed significantly from the 13-14-year-olds on the first item ($\chi^2 = 8.23, p < .01$ and $\chi^2 = 5.45, p < .02$, respectively); second item ($\chi^2 = 5.65, p < .02$ and $\chi^2 = 4.21, p < .05$, respectively); and third item ($\chi^2 = 8.56, p < .01$ and $\chi^2 = 14.27, p < .001$, respectively).

4. *Perceived Attitudes of Significant Others*

The subjects were asked (see Table 1) how certain significant others would react if the subjects were to smoke cigarettes. The alternative answers included that the other person(s) "would be very mad," "would not like it," "would like it," "would be very happy," and "I don't know." Because a very small number of subjects expected that others would react favorably to their smoking, the subjects were divided into (a) those who expected the other person(s) to "be very mad" and (b) those who expected a moderately negative or positive reaction, or who replied "I don't know."⁵ The results, presented in Table 1, reveal that subjects in all age groups believed that their parents would be angrier than would their teachers and good friends. Age seemed to have little effect upon the subjects' perceptions of their parents' reactions, although a somewhat smaller percentage of the 13-14-year group, compared with the 10-11-year group, thought their mothers would be very upset ($\chi^2 = 6.02, p < .02$). On the other hand, age was strongly associated with the perceived reactions of both teachers and good friends, showing a decline with age in the percentage of subjects who predicted their teachers and good friends would be very mad if they began to smoke. With regard to their teacher's feelings, the 7-8-year-olds differed from the 10-11-year-olds ($\chi^2 = 25.78, p < .001$) and the 13-14-year-olds ($\chi^2 = 53.13, p < .001$), who in turn differed from each other ($\chi^2 = 9.77, p < .01$). Likewise, concerning their friends' feelings, the youngest group differed from the two older

⁵ The number of 7-8-, 10-11-, and 13-14-year-olds who expected moderately favorable or very favorable reactions was as follows: from father: 0, 2, and 0, respectively; from mother: 0, 0, and 0, respectively; from teachers: 0, 2, and 3, respectively; from good friends: 10, 8, and 24, respectively.

groups ($\chi^2 = 7.16, p < .01$ and $\chi^2 = 19.90, p < .001$, respectively) and the older groups from each other ($\chi^2 = 4.06, p < .05$). There was no evidence that sex was associated with perception of the attitudes of significant others.

The figures in parentheses indicate that about the same percentage of children in each age group responded that they didn't know how their parents would feel if they smoked. These figures also show that the children were much more likely to be unsure how their teacher and good friends would feel than how their parents would feel. Furthermore, the likelihood that the subjects were uncertain how their teachers would react increased with age: the percentage of 7-8-year-olds was smaller than the percentage of 10-11-year-olds ($\chi^2 = 7.84, p < .01$) and 13-14-year-olds ($\chi^2 = 26.48, p < .001$), who in turn differed from each other ($\chi^2 = 5.72, p < .02$). Also, 7-8-year-olds were less likely to be uncertain how their best friend would react than were the 10-11-year-olds ($\chi^2 = 5.49, p < .02$) and 13-14-year-olds ($\chi^2 = 4.28, p < .05$).

5. *Smokers Versus Nonsmokers*

The 13-14-year group was divided into 21 smokers (those who had smoked a cigarette within the past week) and 80 nonsmokers. Smoking was found to be associated with the smoking habits of best friends but not of parents. Among smokers, 62.5 percent indicated their best friends smoked, while among nonsmokers, 31.2 percent indicated their best friends smoked ($\chi^2 = 9.35, p < .01$). Regarding the fathers of smokers and nonsmokers, 57 percent and 67.5 percent, respectively, smoked, and regarding their mothers, 38.7 percent and 36.2 percent, respectively, smoked.

The smoker-nonsmoker distinction was not associated with beliefs about smoking. However, there was a striking difference between the expressed attitudes of the smokers and nonsmokers, with the former displaying greater tolerance of smoking. A lower percentage of smokers, in contrast to nonsmokers, chose the most negative alternative on each of the three attitude items in Table 1: first item (23.8 percent *versus* 57.5 percent; $\chi^2 = 6.27, p < .02$), second item (23.8 percent *versus* 51.3 percent; $\chi^2 = 4.00, p < .05$), and third item (14.3 percent *versus* 53.8 percent; $\chi^2 = 8.91, p < .01$).

In addition, comparison of the perceptions of smokers and nonsmokers reveals that smokers were less likely than nonsmokers to expect their parents would be very angry if they smoked. Thirty-five percent of the smokers, compared with 68.4 percent of the nonsmokers ($\chi^2 = 6.16, p < .02$) believed their fathers would be very mad; and with respect to their mothers' feelings, the figures were 28.6 percent and 60.3 percent, respectively ($\chi^2 = 5.46, p < .05$).

.02). Smoking was not significantly associated with the perception of the feelings of teachers and best friends.

D. DISCUSSION

The results regarding the smoking experiences of the subjects confirm those of other studies (e.g., 8, 14), showing that few preadolescents smoke cigarettes, but that a substantial increase in the prevalence of smoking occurs in the early years of adolescence. Also, the finding that slightly over 50 percent of the preadolescents had puffed on a cigarette is consistent with other research (6, 8) that indicates that experimentation with cigarettes is common prior to adolescence.

A large majority of children in each age group reported an awareness of the potential dangers of smoking. This finding is in accord with the conclusion of American-wide surveys (3, 6) that most teenagers are aware that smoking represents a serious health hazard. Horn (3) also notes that there is a slight tendency for younger teenagers to acknowledge more readily the harmfulness of cigarettes than for older teenagers. A similar pattern emerged in this study wherein a smaller percentage of 13-14-year-olds than the younger children agreed that smoking shortens a person's life.

Although the majority of children in each of the three age groups expressed highly unfavorable attitudes toward smoking, the analyses indicated a decline in negative attitudes across age with the largest drop occurring between the 10-11- and 13-14-year-olds. Thus, it appears that as children grow older, they are not only more likely to begin to smoke but also their attitudes (and to a slight extent their beliefs) become increasingly more favorable toward smoking. It is important to note that the effect of age is due primarily to differences between the 13-14-year-olds, on the one hand, and the two younger groups, on the other. Only a few significant differences occurred between the 7-8- and 10-11-year-olds.

At least two, not necessarily incompatible, explanations can account for the age differences. As children enter adolescence, a number of social factors begin to operate that are conducive to adopting a more tolerant disposition toward smoking. For one thing, as one grows older, social sanctions against smoking are relaxed. In fact, peer group norms may encourage the initiation of smoking. Salber, Welsh, and Taylor (11) found that conformity to the peer group was the most common reason given by teenagers for starting to smoke. Certainly, in this study the marked increase in the number of friends who smoked between the 10-11- and 13-14-year groups supports the hypoth-

esis that older children are subjected to peer group norms fostering a more favorable orientation toward smoking.

A second, equally plausible, explanation is derived from theories of child development that can account for the age differences in terms of stages of moral development. Piaget (9) suggests that young children are characterized by a heteronomous morality, conceiving of adult rules as absolute and unchangeable, and displaying an unquestioning respect for adult authority. Older children, who are more autonomous in their thinking, are thought to base their moral judgments on personally held standards and values and on a realization of a possible diversity of viewpoints. Thus, the discrepancy between the 13-14-year-olds and the 7-8- and 10-11-year-olds may reflect the fact that the older children, being less absolutistic in their thinking, are more likely to question the societal prescriptions against smoking. The greater tendency for 13-14-year-olds to respond "I don't know" to the attitudinal statements supports this interpretation.

The data in Table 1 concerning the perceived attitudes of significant others are consistent with both the normative and developmental interpretations of the older children's less negative orientation toward smoking. Children from all three age groups were likely to anticipate that their parents would be more upset than their teachers and friends if they were to smoke; and while age was only slightly related to perceived parental attitudes, it was strongly related to the perceived attitudes of both teachers and good friends. Thus, while the subjects in the three age groups anticipated adverse reactions from their parents, the older they were the less opposition to smoking they expected from other important people. It appears that as a child enters adolescence, he perceives a continuance of parental resistance to smoking; however, he also perceives an increased permissiveness from other important figures in his social environment.

Evidence from this study and other sources indicates that many children resolve this conflict between parental resistance and the permissive social environment in favor of the latter. Kohlberg (4) observes from a developmental standpoint that as a child ages, his moral judgments and conduct become less unilaterally influenced by the dictates of parental authority and more products of his experiences in a complex social world. Likewise, Utech and Hoving (15) found that when parents and peers offer conflicting advice, conformity to parents decreases as a function of age. In accord with Kohlberg (4) and Utech and Hoving (15), within the present study a substantially lower percentage of 13-14-year-olds, in contrast to the

younger children, agreed with the suggestion that "Children wouldn't smoke if adults stopped smoking." Also, while the smoking habits of their friends were associated with those of the 13-14-year-olds, the habits of their parents were not. A similar finding has been reported by others (e. g., 2, 5).

The smoker-nonsmoker distinction among the 13-14-year-olds yielded a consistent pattern of results. Unlike a number of other studies (e. g., 1, 6) that indicate that smokers are less accepting of the harmfulness of smoking, whether or not a subject smoked and his beliefs about smoking were not related. On the other hand, in agreement with other research (e. g., 1, 7), smokers did display less negative attitudes about smoking than nonsmokers. Unfortunately, because of the correlational nature of the study, it cannot be ascertained whether or not the more favorable attitudes of the smokers preceded the initiation of their smoking. The temporal question also complicates interpreting the finding that the smokers were less likely than the nonsmokers to anticipate strong resistance to their smoking from their parents.

REFERENCES

1. BAER, D. J. Smoking attitude, behavior, and beliefs of college males. *J. Soc. Psychol.*, 1966, **68**, 65-78.
2. BERGEN, B., & OLESEN, E. Some evidence for a peer group hypothesis about adolescent smoking. *Health Educ. J.*, 1963, **21**, 113.
3. HORN, D. Current smoking among teenagers. *Public Health Rep.*, 1968, **83**, 458-460.
4. KOHLBERG, L. Development of moral character and moral ideology. In M. L. Hoffman & L. W. Hoffman (Eds.), *Review of Child Development Research*. New York: Russell Sage Found., 1964.
5. LEVITT, E. E., & EDWARDS, J. A. A multivariate study of correlative factors in youthful cigarette smoking. *Devel. Psychol.*, 1970, **2**, 5-11.
6. LIEBERMAN RESEARCH INCORPORATED. *The Teenager Looks at Cigarette Smoking*. New York: Lieberman Res., 1969.
7. MAUSNER, B., & MISCHLER, J. B. Cigarette smoking among junior high school students. *J. Spec. Educ.*, 1966, **1**, 61-66.
8. MORRISON, J. B., & MEDOVY, H. Smoking habits of Winnipeg children. *Can. Med. Assoc. J.*, 1961, **84**, 1006-1012.
9. PIAGET, J. *The Moral Judgment of the Child*. New York: Harcourt, 1932.
10. SALBER, E. J., & ABELIN, T. Smoking behavior of Newton school children—5-year follow-up. *Pediatrics*, 1967, **40**, 363-372.
11. SALBER, E. J., WELSH, B., & TAYLOR, S. V. Reasons for smoking given by secondary school children. *J. Health & Hum. Behav.*, 1963, **4**, 118-129.
12. SMITH, G. Relations between personality and smoking behavior in preadult subjects. *J. Consult. & Clin. Psychol.*, 1969, **33**, 710-715.
13. STEWART, L., & LIVSON, N. Smoking and rebelliousness: A longitudinal study from childhood to maturity. *J. Consult. Psychol.*, 1966, **30**, 225-229.
14. UNITED STATES PUBLIC HEALTH SERVICE. *Smoking and health*. PHS Publication No. 1103, U. S. Public Health Service, Washington, D.C., 1964.

15. UTECH, D. A., & HOVING, K. L. Parents and peers as competing influences in the decisions of children of differing ages. *J. Soc. Psychol.*, 1969, **78**, 267-274.
16. VELDMAN, D. J., & BOWN, O. H. Personality and performance characteristics associated with cigarette smoking among college freshmen. *J. Consult. & Clin. Psychol.*, 1969, **33**, 109-119.
17. WOHLFORD, P. Initiation of cigarette smoking: Is it related to parental smoking behavior? *J. Consult. & Clin. Psychol.*, 1970, **34**, 148-151.

Department of Psychology
University of Windsor
Windsor, Ontario, Canada N9B 3P4

THE EFFECT OF VALENCE ON PERFORMANCE IN A CONSERVATION TASK*¹

United States Air Force Academy

JOHN H. BERMUDEZ, DIRK C. PRATHER, GENE A. BERRY,
AND ROBERT B. TEBBS

SUMMARY

Two separate experiments were completed to test the effect of valence on performance of kindergarten Ss on a conservation task. Forty-eight Ss in Experiment I, with a mean age of 5.5 years, were asked to conserve a volume of liquid. A significant number of Ss failed to conserve the volume ($p < .001$), but when valence—desirability of the liquid to drink—was added, a significant number of Ss changed their choices ($p < .02$) to show conservation. Thirty-eight Ss in Experiment II, with a mean age of 5.5 years, were asked to conserve volume of liquid with valence attached to the first choice. A significant ($p < .01$) number of Ss showed conservation of volume. The results of the two experiments were compared and discussed in relation to valence and language development as relevant variables in conservation tasks.

A. INTRODUCTION

Piaget and numerous investigators (3) have advanced the highly consistent finding that children, on the average, increase their power of logical cognition at various successive chronological stages. Piaget developed a series of tasks to determine how a child thinks about a problem. Some of these tasks include the principle of conservation, or the conservation (invariance) of a quantity (e. g., number, substance, weight, length, area, and volume) despite a transformation in appearance. Thus, a quantity of liquid in a container of a particular shape can be poured into a container of a different shape and still remain the same amount of liquid. Under experimental conditions, many children will verbalize that the amount of liquid

* Received in the Editorial Office on February 1, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The views expressed herein are those of the authors and do not necessarily express the views of the United States Air Force or the Department of Defense.

has changed, and it is generally agreed that only with experience and time will they understand that the amount is really the same despite how the substance is treated.

It is frequently stated that validative studies in conservation give insufficient consideration to the motivational and linguistic context of the conservation task employed. A child's motivation, expectations, and immature linguistic comprehension may mask a true measure of his logical functioning. Failure to consider these modifying variables can be a crucial factor in determining the kind and quality of a child's intellectual functions. However, the problem of contending with motivational state and verbal ability has troubled a number of investigators (3).

The purpose of the current experiments is to focus on the area of both motivational and language valencies. Mehler and Bever (5) employed a conservation of number task using clay buttons and M&M candies, and suggested that the use of candy provided increased motivation to conserve. Rothenberg and Courtney (7) advanced an alternative explanation and proposed that the increased motivation effect was a function of the questions asked. For example, they stated that the word "eat" can be more readily understood by children than the word "more." In a replication of Mehler and Bever's study, Higgins-Trenk and Looft (4) used wooden buttons and M&M candies. They failed to replicate the findings of Mehler and Bever but observed that neither of two experimental age groups successfully completed one task (button item) significantly more often than Ss in the other (M&M item) group. They commented, "This leaves open to question the importance of the motivational component inherent in any specific task designed by experimenters" (p. 287). Dimitrovsky and Almy (2), in an extensive longitudinal study, showed that children can conserve perceptually, yet are unable to verbalize the conservation.

The current studies employ the task of conservation of liquid in order to investigate the relative influence of both the motivational and language components. These experiments attempt to answer the question: How much is the level of correct conservation responses in kindergarten children affected by language valency, and how much is it affected by incentive valency? Studies of child and adult performance under varying magnitudes of reward have generally found the incentive magnitude effect to be significant when each S is aware of the alternative incentives available, and S's behavior involves a process of magnitude comparison. This effect is noted when persons receiving the better (larger, bigger, etc.) of a choice of rewards demonstrate a superior level of correct performance (1, 6). The current studies used

unequal amounts of a desirable soft drink as the liquid to be conserved. This allowed comparisons of performance under conditions of unequal amounts and valence of the substance and different language valence.

B. METHOD

1. *Subjects*

Eighty-six kindergarten students from four classes were randomly divided into two groups. Group I served in Experiment I, and Group II served in Experiment II. Both experiments were conducted simultaneously. Group I consisted of 23 boys and 25 girls with an average age of 5 years 5.9 months. Group II consisted of 20 boys and 18 girls with an average age of 5 years 5.4 months.

2. *Apparatus*

In both Experiments I and II, the equipment consisted of two identical 250 cc ungraduated beakers; one tall, thin 250 cc ungraduated cylinder; a glass pitcher of red Kool-Aid; and a small table which was eye level to the Ss. At all times the tall cylinder remained between the two shorter beakers, and the pitcher was kept from view until used.

3. *Procedure—Experiment I*

Ss were tested individually at their schools. As *S* approached the table, he faced the three clear glass containers. One of the 250 cc beakers contained 150 cc of Kool-Aid, and the other 250 cc beaker contained 75 cc of Kool-Aid. The relative fluid heights were two to one. The tall, narrow cylinder was empty. *S* was first instructed as follows: "Point to the one that has the most Kool-Aid in it," and his reaction was recorded. The Kool-Aid in the beaker containing the lesser amount was then poured into the tall cylinder so that the fluid level rose above that of the other beaker. The relative fluid height (cylinder to beaker) was three to one. *S* was again asked: "Point to the one that has the most Kool-Aid in it." The *E* then handed *S* a paper cup and said: "Point to the one you want me to pour into your glass to drink." *S* was then asked: "Why did you pick that one?" Following his explanation, *S* was given Kool-Aid from the pitcher.

4. *Procedure—Experiment II*

The arrangement for the second experiment was exactly the same as for Experiment I except that *E* told each *S*: "I am going to give you some Kool-Aid to drink." *S* was then handed a paper cup and was requested to

"Point to the one you want me to pour into your glass to drink." *S* was then asked: "Why did you pick that one?" *E* then poured the liquid from the beaker containing the lesser amount into the tall, narrow cylinder and repeated this request. The relative fluid height (cylinder to beaker) was three to one. Following his reaction, *S* was again asked: "Why did you pick that one?" and was given Kool-Aid from the pitcher.

C. RESULTS

1. *Experiment I*

To the first question: "Point to the one that has the most Kool-Aid in it," 47 out of 48 *Ss* indicated the 250 cc beaker that contained 150 cc of liquid over the 250 cc beaker that contained 75 cc. After the 75 cc of liquid had been poured from the beaker into the taller, narrower cylinder, the same question was repeated. This time nine *Ss* indicated the beaker with 150 cc, and 39 *Ss* the cylinder with 75 cc. These data were analyzed by a χ^2 one-sample test and found to be significant ($\chi^2 = 18.74$, $p < .001$, two-tailed).

The *Ss* were then asked the question: "Point to the one you want me to pour into your glass to drink." To this question, 26 *Ss* indicated the beaker with 150 cc, and 22 *Ss* the cylinder with 75 cc. These data were analyzed by the McNemar test for the significance of changes (8). The change was significant ($\chi^2 = 6.32$, $p < .02$, two-tailed). Of the 26 *Ss* who selected the beaker containing 150 cc to drink, in response to the third question, 17 had previously indicated, in response to the second question, that the cylinder contained the most liquid. When questioned, nine of the 17 *Ss* indicated that the beaker with 150 cc contained the greater amount of Kool-Aid to drink. The remaining eight *Ss* would not give a reason why they changed their choice. The only responses that were converted by *E* in tabulating the data were those in which a child indicated that he wanted a lesser amount because he did not like Kool-Aid. These responses were treated as correct conservation responses.

2. *Experiment II*

To the first question—"I am going to give you some Kool-Aid to drink. Point to the one you want me to pour into your glass to drink"—37 out of 38 *Ss* indicated the 250 cc beaker that contained 150 cc over the one that contained 75 cc. After the 75 cc of liquid from the 250 cc beaker had been poured into the taller, narrower cylinder, the *Ss* were again asked the same question. This time 27 *Ss* indicated that they wanted the liquid from the

beaker with 150 cc, and 11 Ss the liquid from the cylinder with 75 cc. This difference was significant ($\chi^2 = 6.72$, $p < .01$, two-tailed). Responses in which a child indicated that he wanted a lesser amount of Kool-Aid because he did not like it were treated as correct conservation responses.

D. DISCUSSION

The present results suggest that similar Piagetian investigations should consider the valence effect of contrasted incentives, of language, and of order or timing in the presentation of the motivational situation.

The findings of Experiment I indicate that the number of correct conservation responses is higher with an incentive contrast than without it. This increase was observed among Ss who verbalized the conservation and among those who did not. These findings are consistent with Mehler and Bever's suggestion of improved performance with motivation and Dimitrovsky and Almy's findings of ability to conserve despite inability to verbalize. Only 19% (nine) of the Ss made correct conservation responses after comparing the cylinder-beaker fluid levels. At this time, Ss were not aware of the opportunity to drink the amount of Kool-Aid selected. With awareness, 54% (26 Ss) of the same group of Ss made correct responses. Almost one-half of these Ss could not or would not verbalize why they did so. It can be inferred from these results that motivation through incentive contrast has a powerful effect on performance, but it is also possible that the valency of the words used to present the incentive contrast caused the effect. The findings of Experiment II, however, suggest that improved performance may be attributed more to an effect of the order or timing of the motivation situation than to word valency.

In Experiment II, 71% (27 Ss) of the Ss in Group II made correct responses after comparing the cylinder-beaker fluid heights. However, these Ss were aware from the beginning of the experiment that they could drink the selection of their choice, whereas Ss in Experiment I were made aware only after they had been required to indicate that one of the containers held the most fluid.

This difference in the order of presentation may have accounted for the larger percentage of correct responses made by Ss in Group II (71% *versus* 54%). Perhaps the number of Ss in Group I who changed their choice from the cylinder containing 75 cc to the beaker containing 150 cc, in response to the third question, was depressed as an effect of these Ss having previously made a public declaration of amount (in response to question two). An equally likely possibility is that these Ss distrusted *E* or had the suspicion

that *E* had employed some magical manipulation and was trying to trick them.

These results appear to give greater support to the position that the true level of a child's functioning in logical operations may be masked more by the motivational situation than by the influence of word valency. However, it is important to note that the average age of these *Ss*, as well as the number of *Ss* who failed the conservation task, was generally consistent with Piaget's hypothesis of stage-age relationship.

REFERENCES

1. BLANK, H. D., & MONGE, R. H. Effects of awareness of alternative incentive magnitude and shifts in magnitude on card sorting. *Psychol. Rep.*, 1970, 27(1), 119-125.
2. DEMITROVSKY, L., & ALMY, M. Language and thought: The relationship between knowing a correct answer and ability to verbalize the reasoning on which it is based. *J. of Psychol.*, 1972, 80, 15-28.
3. FLAVELL, J. The Developmental Psychology of Jean Piaget. Princeton, N. J.: Van Nostrand, 1963.
4. HIGGINS-TRENK, A., & LOOFT, W. R. Cognitive capacity of very young children: Yet another replication. *J. of Psychol.*, 1971, 79, 285-289.
5. MEHLER, J., & BEVER, T. G. Cognitive capacity of very young children. *Science*, 1967, 158, 29-32.
6. MONGE, R. H., & BLANK, H. D. Is there an incentive magnitude effect on adult performance? *Psychol. Rep.*, 1970, 27(3), 983-992.
7. ROTHENBERG, B. B., & COURTNEY, R. G. Conservation of number in very young children: A replication of and comparison with Mehler and Bever's study. *J. of Psychol.*, 1968, 70, 205-212.
8. SIEGAL, S. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 1956.

Department of Life and Behavioral Sciences
USAF Academy, Colorado 80840

ASTROLOGICAL INDICATORS OF PERSONALITY*¹

Roosevelt University and Stockton State College

BERNIE I. SILVERMAN AND MARVIN WHITMER

SUMMARY

Subjects indicated how aggressive, ambitious, creative, intuitive, and extroverted they thought they were on nine point rating scales and completed the Eysenck Personality Inventory. Each subject also designated a friend who described the subject on the same set of rating scales. As exact birth times were available for subjects, it was possible to determine their sun, moon, and ascending signs. The results showed that the astrological indicators of personality were not related to either self or friends' descriptions of the subjects' personalities.

A. INTRODUCTION

Most psychologists no doubt find it difficult to believe that the position of the planets in the 12 signs of the zodiac at the time of birth has some bearing upon later personality. Yet research has been reported that gives astrology some credibility.

Jung (5) found that the woman's sun and the man's moon were in conjunction in 10% of married couples' horoscopes, while in a control group of horoscopes taken from randomly assigned couples this configuration occurred 5% of the time. Although Jung believed that the difference between these values was not statistically significant, a t test between sample proportions shows that it is ($t = 3.57$, $df = 32$, 400 , $p < .01$). This finding can be interpreted to mean that the sun and the moon both play a role in interpersonal attraction.

A study by Jonas has been reported (7) which suggests that the position of these heavenly bodies may influence a child's sex. He was able to predict the sex of infants in 83 of 100 cases by first estimating the month of con-

* Received in the Editorial Office on February 4, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Thanks are due Mrs. Marge Ewell for providing an independent assessment of the values of the 12 signs in terms of the various personality dimensions. The help of Kerry Brown, Ronald Stabilini, Clifford Gunderson, and other students at Stockton State College in calculating horoscopes and administering questionnaires is also appreciated.

ception, and then noting the sign in which the moon fell when it formed an angle with the sun identical to the sun-moon angle in the mother's own natal horoscope. If the moon fell in Aries, Gemini, Leo, Libra, Sagittarius, or Aquarius a boy was predicted, while if it fell in any of the other signs, the prediction was a girl.

Closer to the realm of personality prediction, several investigations are reported to have shown that the phases of the moon are related to human aggressiveness manifested in violent crime (4, 6).

On the other hand, Silverman (9) found no relationship between sun signs and subjects' value rankings and between sun signs and their choice of marriage partners. Perhaps astrology was not supported because other astrological indices of subjects' personalities were not considered.

From previously cited studies it appears the moon may be related to earthly events and, more specifically, to personality. In fact, astrologers have contended that along with the sun sign, the sign in which the moon is found at the moment of birth exerts a strong influence on subsequent personality (1). Another astrological index of personality is the ascending sign, the sign on the horizon at the moment of birth. This sign attains significance because it falls within the first house of the horoscope, the house traditionally associated with personality. "Taking things in their proper order, the focal points of the horoscope are the sun's sign, the moon's sign, and the sign on the ascendent of the chart" (4, p. 53).

To determine whether astrology based personality descriptions were related to people's personalities, independent measures of personality are required. Most investigations measure subjects' personalities by relying upon self-reports recorded on questionnaires, and this study was no exception. Yet in using such a measure there is always the nagging doubt that responses reflect something other than honest self-perceptions of feelings and actions (2, 3). As agreement between two instruments that theoretically measure the same thing increases the chances that each measures what it purports to, self-reports were compared to friends' ratings of subjects' personalities. Friends' ratings thus served to provide both a second criterion against which astrological predictions could be tested and a check on subjects' own self-descriptions.

The first hypothesis tested was that sun sign, moon sign, and ascendent are significantly related to subjects' self-descriptions. The second hypothesis tested was that the three astrological indicators of personality are significantly related to friends' descriptions of subjects' personalities.

B. METHOD

Subjects were 130 students and faculty at Stockton State College. Each indicated how aggressive, ambitious, creative, extroverted, intuitive, practical, warm, and adaptable he thought he was on nine point scales measuring these attributes. For example, a subject could indicate he was not at all aggressive by circling 1, slightly aggressive by circling 3, moderately aggressive 5, aggressive 7, and very aggressive 9. After completing these eight scales, subjects filled out the Eysenck Personality Inventory, and from their responses to this questionnaire extroversion scores were subsequently calculated. Subjects then were asked to provide the exact time and place of their birth, as well as the name of a friend at Stockton who knew them well enough to provide an accurate personality description. Those who did not know their birth time were instructed to ask their parents and provide the information at a later date. Only after all questionnaires were completed was the purpose of the study made clear.

Next, those designated as friends were asked to describe the subject on the same eight scales used by the subjects to describe themselves. Eighty-six friends eventually completed these scales. Horoscopes for each subject were calculated as soon as birth times became available.

On the basis of descriptions found in several astrology books (1, 4, 8) the experimenters rated each sign on five point scales in terms of how much of the eight personality attributes it symbolized. A rating of 5 indicated that a sign denoted much of an attribute, while a rating of 1 meant that little of an attribute was denoted by a particular sign. To check the validity of these ratings, a professional astrologer repeated the task, and the two sets of ratings were compared. Table 1 shows the ratings *assigned by the experimenters* to each sign on five of the personality dimensions, as well as the strength of the relationships between the astrologer's and the experimenters' ratings. The reliability coefficients reveal that in most cases there was agreement between the experimenters and the astrologer with regard to how much of each personality attribute was denoted by the 12 signs of the zodiac.

Astrological personality predictions were made by assigning to subjects the experimenters' ratings corresponding to their sun sign, moon sign, and ascending sign on each of the five tabled personality dimensions. For example, if a subject's sun was in Sagittarius, his moon in Aries, and if Pisces was his ascending sign, the predictions would be that he was average in extroversion ($3 + 5 + 1/3 = 3.00$), average in ambition ($3 + 5 + 1/3 =$

TABLE 1
ATTRIBUTES OF ASTROLOGICAL SIGNS^a

Sign	Aggressive ($r = .68^*$)	Ambitious ($r = .61^*$)	Creative ($r = .56$)	Extroverted ($r = .82^{**}$)	Intuitive ($r = .88^{**}$)
Aries	5	5	3	3	3
Taurus	3	3	3	3	2
Gemini	3	3	3	4	3
Cancer	1	2	4	3	5
Leo	4	5	5	5	3
Virgo	3	3	1	2	1
Libra	2	1	3	4	3
Scorpio	5	4	3	2	5
Sagittarius	3	3	3	5	3
Capricorn	4	5	1	1	1
Acquarius	3	3	3	3	4
Pisces	1	1	5	1	5

Note: Correlations within parentheses refer to interrater reliability between experimenters and astrologer.

^a A high rating indicates that much of an attribute was denoted by a sign; a low rating indicates that little of an attribute was denoted.

* $p < .05$.

** $p < .01$.

3.00), average in aggressiveness ($3 + 5 + 1/3 = 3.00$), and more creative ($3 + 3 + 5/3 = 3.66$) and more intuitive than most ($3 + 3 + 5/3 = 3.66$). These were the ratings that were correlated with subjects' self-descriptions and friends' ratings of their personalities to test the validity of astrology.

C. RESULTS AND DISCUSSION

Table 2 shows the correlations between friends' and subjects' ratings of the latter's aggressiveness, ambition, creativity, extroversion, and intuition. Significant relationships were found on these five personality dimensions. On the other hand, nonsignificant correlations were found for the dimensions of warmth ($r = .15$), practicality ($r = .08$), and adaptability ($r = -.03$). It seemed unfair to expect astrology to predict subjects' personalities on these three dimensions when the raters themselves could not agree on the degree to which subjects manifested these attributes. Therefore they were excluded from the analysis.

On Table 2 the r column under "Self-ratings" shows the correlations between subjects' own self-descriptions and the weights assigned their sun signs, moon signs, ascending signs, and the average of combination of all three. None attained significance. Although they are not tabled, it is interesting to note that the four astrology based ratings of subjects' extroversion failed to correlate with subjects' extroversion scores on the Eysenck Personality Inven-

TABLE 2
PERSONALITY RATINGS AS A FUNCTION OF SUN, MOON, ASCENDING,
AND COMBINED SIGNS

Sign	Self-ratings ($N = 130$)		Friends' ratings ($N = 86$)	
	r	F	r	F
Aggressive ($r = .37$)**				
Sun	.07	.83	.01	.91
Moon	.09	1.10	-.08	.47
Ascending	.07	1.39	.03	.62
Combined	.13		.05	
Ambitious ($r = .25$)*				
Sun	.13	1.34	-.01	.62
Moon	.07	1.32	-.08	.80
Ascending	.12	1.25	.06	.84
Combined	.18		-.01	
Creative ($r = .24$)*				
Sun	.00	1.15	.13	1.28
Moon	.11	.81	.10	1.37
Ascending	-.01	.57	-.02	.17
Combined	.03		.10	
Extroverted ($r = .34$)**				
Sun	.01	.64	.09	.64
Moon	-.01	.85	.22*	.95
Ascending	.08	1.18	.01	.85
Combined	.05		.17	
I-E scale ^a	.46*		.26*	
Intuitive ($r = .33$)**				
Sun	.06	.23	.14	1.67
Moon	-.05	.56	.07	.83
Ascending	-.04	1.41	.00	.98
Combined	-.01		.12	

Note: Correlations within parentheses refer to interrater reliability between self and friends' ratings.

^a Subjects' extroversion scores on the Eysenck Personality Inventory.

* $p < .05$.

** $p < .01$.

tory. There was a substantial relationship, ($r = .46$) however, between these scores and subjects' ratings of their own extroversion.

On Table 2 the r column under "Friends' ratings" shows the correlations between friends' ratings of subjects' personalities and the weights assigned subjects' sun signs, moon signs, ascending signs, and the average of all three. The position of the moon in the zodiac and the Eysenck Personality Inventory scores were both related to friends' ratings of subjects' extroversion. Only one of the 40 correlations calculated between astrology based personality descriptions and the two sets of criteria ratings attained significance.

It seemed possible that this lack of relationship was due to a misinterpretation of the signs' meanings. Perhaps sun signs, moon signs, and ascending

signs are related to personality, but not in the way the weightings in Table 1 would suggest. To test this possibility, one-way analyses of variance were performed on both subjects' and friends' ratings of subjects' personalities with sun signs, moon signs, and ascending signs serving as the independent variables. The F columns of Table 2 show that not one of the 30 analyses was significant. Therefore sun signs, moon signs, and ascending signs were not related either to subjects' self-descriptions or to friends' descriptions of their personalities.

At first glance the small correlations between friends' and subjects' ratings of the latters' personality might suggest that peoples' perceptions of their own personalities are peculiar to themselves and ought not to be invested with great importance. The implications of this suggestion for research based solely upon self-report measures of personality are both obvious and ominous. However, it is unfair to interpret the correlations shown in Table 2 in the same way as those typically used as indices of agreement between judges. Traditionally, correlations are computed between two judges' ratings of the same set of subjects. But in the present study each object was evaluated by a different pair of judges so that the ratings of 172 individuals generated the correlations in question. These correlations were bound to be artificially attenuated to the extent that the individual judges differed in their use of the rating scales (e. g., leniency error) and employed different frames of reference in defining the nine points along each personality continuum. In light of these considerations, the small size of the correlations reflecting judges' agreement should prove less troublesome.

The results of this study do not conclusively show that astrology is invalid as a means of predicting or gaining insight into personality. It remains possible that if all astrological indicators were simultaneously considered along with those tested herein, significant relationships with subjects' personalities might be found. However, the fact that the three single most important astrological personality indicators failed to correlate with both friends' and subjects' descriptions of the latters' personalities reduces the likelihood of this possibility being true.

REFERENCES

1. ADAMS, E. *Astrology—Your Place Among the Stars*. New York: Dodd, Mead, 1930.
2. CROWNE, D., & MARLOWE, D. *The Approval Motive*. New York: Wiley, 1964.
3. EDWARDS, A. L. *The Social Desirability Variable in Personality Assessment and Research*. New York: Dryden, 1957.
4. GOODAVAGE, J. *Write Your Own Horoscope*. New York: Signet, 1968.
5. JUNG, C. G. *The Structure and Dynamics of the Psyche*. Princeton, N. J.: Princeton Univ. Press, 1969.

6. LIEBER, A. L., & SHERIN, C. The moon's effect on murders. *Los Angeles Times*, May 5, 1972. P. 12.
7. OSTRANDER, S., & SCHROEDER, L. *Astrological Birth Control*. Englewood Cliffs, N. J.: Prentice-Hall, 1972.
8. PARKER, D., & PARKER, J. *The Compleat Astrologer*. New York: McGraw-Hill, 1971.
9. SILVERMAN, B. I. Studies of astrology. *J. of Psychol.*, 1971, **77**, 141-149.

*Department of Psychology
Roosevelt University
430 South Michigan Avenue
Chicago, Illinois 60605*

SUMMER JOB PREFERENCES*

Public Service Commission of Canada

SHIRLEY A. EDWARDS AND MICHAEL W. MCCARREY

SUMMARY

A study of summer and permanent job motives of 153 students employed by the Federal Government of Canada during the summer of 1973 revealed that when these students are looking for a summer job, they consider the same factors, in the same order of importance, as when they are thinking in terms of a permanent job. Furthermore, the results indicate that this group of students does not appear to differ significantly from other workers in their motives for job preference. In addition, the findings suggest very strongly that the majority of students are highly concerned with the practical aspects of their summer job and are primarily interested in obtaining career relevant experience.

A. INTRODUCTION

There is a plethora of studies dealing with job preferences that focus on jobs that are held for an extended period of time (1), but very little attention has been paid in the past to the area of short term employment preferences. Nevertheless, it is generally assumed that the motives of students seeking summer jobs differ considerably from the motives of those seeking more permanent positions. For example, Russell and Conner (5, p. 219), reporting on Canadian students, have stated as follows:

... a very special function is performed by summer job experience in providing a vehicle for the expression of altruistic motives and the satisfaction of needs not met by most career options.

They predicted that the factors that were important to students in determining summer job preference would be very different from those factors that have been found to be important in permanent job preferences. The results from their study of students in Southern Alberta do in fact appear to confirm their prediction. The direction of job preferences in their sample

* Received in the Editorial Office on February 6, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

was away from the practical and towards personal and social ideals. Altruism and the 'outdoors constituted major motives for both males and females. Russell and Conner concluded that the summer job market is unique as a life experience in that it affords the student an opportunity to sample jobs on the basis of his/her ideals rather than the criterion of practicality. They point out, furthermore, that this conclusion has direct implication for government sponsored student work programs.

One such government program which would be seriously affected if Russell and Conner's findings are confirmed is the Career Oriented Summer Employment Program administered by the Public Service Commission of the Federal Government of Canada.

The objective of the Career Oriented Summer Employment Program is to provide students with meaningful and challenging summer assignments. Meaningful assignments are defined as those (a) relevant to the career plans and interests of the students; (b) relevant to their university courses; and (c) which would provide an insight into the practical aspects of their chosen career field. Challenging assignments are defined as those that require from the students (a) initiative; (b) self-direction; (c) responsibility; (d) performance of a variety of duties; and (e) a "stretching" of their capabilities.

If the results from Russell and Conners' study can be generalized to other students, then the Career Oriented Summer Employment Program is attempting to provide something the students are not interested in nor concerned about.

B. PROCEDURE

In an attempt to explore further the preferences of students seeking summer jobs, semistructured interviews were carried out with 153 students working in the Public Service during the summer of 1973. Seventy-nine of these students were in special career-oriented positions, while the other 74 students had been hired through the Canada Manpower Centres to fill vacancies in government departments. The total sample comprised 103 males and 50 females from universities, community colleges, and Cégeps.¹ Most of the students were from Ontario and Quebec, but a small number came from the Atlantic and Western regions. The two groups of students did not differ significantly by age, by cultural background, by previous summer employment, or by parental income. They did differ, however, on

¹ Les Collèges d'Enseignement Général et Professionnel (Cégeps) constitute one phase of the educational system in the Province of Quebec.

level of education. More of the students in career-oriented positions than students in ordinary summer positions had at least four years of education after senior matriculation (high school diploma which meets university entrance requirements).

Near the beginning of the interview the students were presented with a list of 17 factors and asked to rank them in order of importance to them in a summer job. Towards the end of the interview (i. e., about one hour later) they were presented with a list of 15 of the same 17 factors and asked to rank them in order of importance to them in a permanent job.

In addition, in order to account for the possibility that the lists of factors presented to the students did not contain some of the factors that students consider to be important, each student was asked during the interview what characteristics he would look for in a summer job that he would not look for in a permanent job and *vice versa*.

C. RESULTS

The rankings were analyzed to see if the hierarchy for a summer job was different from that for a permanent job. There were minor shifts in the rankings, but no real significant differences were apparent. The Spearman rho was .87 indicating a high degree of similarity between the two rankings. The five most important factors that students said they would consider when choosing either a summer or a permanent job are (a) practical experience in their career field; (b) opportunity for personal development and growth; (c) pay; (d) challenging nature of work; and (e) opportunity to demonstrate initiative.

In response to the open-ended questions "What characteristics did you look for in a summer job that you would not look for in a permanent job?" and *vice-versa*, the only item given that was not already included in the lists that were ranked was "opportunity for advancement." This response was given with respect to a permanent job.

The data were also analyzed to reveal any differences between the rankings of the students in Career Oriented positions and the students hired through the Canada Manpower Centres. There were no significant differences between the two groups on their rankings of summer job factors or permanent job factors. The Spearman rho for both summer and permanent jobs was .94. Both groups of students ranked "practical experience in my career field" as being the most important factor for them in a summer job.

D. DISCUSSION

The rankings of summer and permanent job factors suggest that when these students are looking for a summer job they consider the same factors to be important as when they are thinking in terms of a permanent job. Furthermore, the lack of difference between the rankings of the students in the Career Oriented Program and the students hired for regular summer employment negates the hypothesis that some students deliberately opt out of a career related summer experience. This suggests, contrary to Russell and Conner's (5) findings, that there definitely are students who are eager for practical summer experiences that will aid them in their careers.

It could be said that the factors presented to the students were limited and did not cover all the alternatives that a student may consider in choosing a job. This is true; however, the responses of the students to the two open-ended questions, in which they had complete freedom to list factors of importance, also supported the finding that the students consider summer jobs in much the same light as more permanent jobs. Furthermore, the responses to the open-ended questions revealed that the two lists of job factors, while not entirely complete, were really only missing one item (i. e., opportunity for advancement).

How do the factors given by these students compare with factors identified in previous research as being important in career or job preference? Herzberg (3) in a review of career preference studies summarized the following 10 factors in order of their frequency of occurrence: (a) intrinsic aspects of job; (b) supervision; (c) security; (d) company and management; (e) working conditions; (f) wages; (g) opportunity for advancement; (h) social aspects of job; (i) communication; and (j) benefits. Garwood (2) has stated that "it should be expected that the factors which influence an individual to accept or reject a particular offer would be similar to those factors that subsequently determine satisfaction or dissatisfaction on the job" (p. 3). In a review of the job satisfaction literature Ronan (4) found that the most frequent dimensions of job satisfaction were (a) the content of the work, actual tasks performed, and control of work; (b) supervision of the direct sort; (c) the organization and its management; (d) opportunities for advancement; (e) pay; (f) co-workers, and (g) working conditions. These seven factors have been found to be of more or less importance in various studies but seem to cover the most important sources of job satisfaction.

A comparison of both Herzberg's (3) 10 factors and Ronan's (4) seven

with the rankings and responses of the students indicates only two factors that the students did not consider to be of much importance. These two factors were "the organization and its management," which was ranked 13 for a permanent job, and "quality of supervisor," which was ranked 11. Thus, this group of students does not appear to differ that markedly from other workers in their motives for job preference. Russell and Conner (5), however, found that the students in their sample did differ from other workers in that the motives of altruism and a preference for the outdoors assumed high importance. They presented their students with a set of 16 job descriptions representative of the range and type of summer jobs available to students in southern Alberta. A nine-point scale ranging from "not preferred" to "strongly preferred" accompanied each job description. The scales were completed by 120 male and 141 female first and second year community college students.

There are thus two possible explanations for their results. Firstly, the range and type of jobs available in southern Alberta would appear to be much more limited than in other areas of the country. This restricts the students' choice and determines *a priori* the kinds of factors that can be found. Secondly, the fact that the students came only from a community college would suggest that these results may not be generalizable to other students. Our findings, in fact, suggest very strongly that the majority of students are concerned with the practical aspects of their summer jobs and are extremely interested in getting career relevant experience.

REFERENCES

1. DELLA ZAZZERA, C., EDWARDS, S., & MCCARREY, M. Job satisfaction of summer students: A literature review. Technical report 73-05, Public Service Commission of Canada, Ottawa, Ontario, 1973.
2. GARWOOD, J. Intrinsic and extrinsic factors in organizations choice. Presented at Canadian Psychological Association, Victoria, British Columbia, 1973. Unpublished manuscript, McGill University, Montreal, Quebec, Canada.
3. HERZBERG, F. Job Attitudes: Review of Research and Opinion. Pittsburgh, Pa.: Psychol. Serv. Pittsburgh, 1957.
4. RONAN, W. W. Individual and situational variables relating to job satisfaction. *J. Appl. Psychol. Monog.*, 1970, 54(1), Part 2.
5. RUSSELL, G. W., & CONNER, R. D. Characteristics of student summer employment. *J. of Psychol.*, 1972, 80, 213-222.

Organizational Behavior Research Division
 Personnel Psychology Centre
 Public Service Commission
 28th Floor, Tower "C," Place de Ville
 Ottawa, Ontario, Canada K1A 0M7

THE EFFECT OF INTERPERSONAL CENSURE ON THE COGNITIVE PERFORMANCE OF ACUTE PROCESS AND REACTIVE SCHIZOPHRENIC PATIENTS*

University of Delaware

PETER G. ALLEN

SUMMARY

Newly admitted male schizophrenic patients ($N = 32$) and normals ($N = 16$) were assigned to one of two treatments: (a) interpersonal censure; (b) neutral, no censure. Patients were divided into good (reactive) or poor (process) prognosis on the basis of Phillips' (5) scale scores. Change scores on a similarities task indicated that normals and reactive Ss improved their performance after censure, while process Ss showed a decrement. No reliable changes occurred in the neutral condition.

A. INTRODUCTION

The social-motivational model of schizophrenia (6) has generated considerable research, with both confirming and disconfirming results. A methodological shortcoming of many studies relating to this censure-deficit model has been the use of patient subjects who have experienced several months of institutionalization (e. g., 1, 7). Researchers have seldom used acute (i. e., first or second admission) subjects.

Using newly admitted patients, Lefcourt *et al.* (3) found that male reactives did not show the predicted performance decrement on an expressive (similarities) task when confronted by a male experimenter. No form of threat or censure was in fact delivered.

The goal of the present study was to assess cognitive performance, as measured by similarities change scores, of newly admitted process and reactive schizophrenics and of normals, when censured by a male authority figure. Following Lefcourt *et al.* (3), it was hypothesized that the reactive-censure subjects would show significantly greater performance decrement on this expressive task than the process-censure group as a result of *being* censured by a male authority figure.

* Received in the Editorial Office on February 13, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

B. METHOD

1. Design

The design was a 3 (Diagnosis) \times 2 (Treatment) factorial, generating six experimental groups: normals receiving censure (N-C) or no censure (N-NC), process schizophrenics receiving censure (P-C) or no censure (P-NC), reactive schizophrenics receiving censure (R-C) or no censure (R-NC).

2. Subjects

Schizophrenic Ss were selected from newly admitted, first or second admission patients.¹ All were tested within three weeks of admission to reduce medication effects. The 16 normal Ss were volunteers from nursing service. Subjects were group matched for intelligence and socioeconomic class.

3. Procedure

Patient Ss were judged to warrant a diagnosis of schizophrenia if at least two of the following three criteria were met: (a) ward staff impression; (b) MMPI profile; (c) psychiatrist's diagnosis. Subjects were randomly assigned to treatment condition and to which half of the similarities task would be administered first. In the censure condition, after the first half of the similarities had been individually administered, Webb's (7) "threat of failure" anxiety induction was used.

Noncensured Ss were allowed to rest during the two-minute interval. After this interval, all Ss were individually administered the remaining similarities. Finally, all Ss were debriefed as to the nature of the study.

Structured interviews conducted by *E* after testing developed information for rating patients on Phillips' (5) Premorbid History scale. These scores were dichotomized as follows: 16 and above, process; 13 and below, reactive. Similarities were scored in accordance with Wechsler's (8) procedure. The experimenter scored all similarities without knowing the subject's identity.

C. RESULTS

Pretreatment group means were between 26.5 and 30.5 points. No significant differences emerged on the first similarities task (all *ts* < 2, *ps* > .10).

The dependent variable of interest was the change in score between the two forms of the similarities. Within-group comparisons revealed that the

¹ To achieve equal *N* in each cell, two process patients (one P-C, one P-NC) and one reactive (R-NC) patient were randomly deleted from statistical analysis.

R-C Ss showed the most significant change ($t = 3.21, p < .02$); this result was due to improved scores on the posttest. Changes in the other two censored groups approached significance ($ts > 2, ps < .10$). Their results were in opposite directions, with improvement by normals and decline by process Ss.

An analysis of variance revealed that only the interaction effect (Diagnosis \times Treatment) was reliable ($F = 4.05, df = 2, 42, p < .025$).

In between-group comparisons, the reactives' improvement under censure led to significant differences² between them and the P-C group ($t = 3.75, p < .01$), the R-NC group ($t = 2.17, p < .05$), and the N-NC group ($t = 3.02, p < .01$). The only other significant comparison was between the N-C and P-C groups ($t = 2.88, p < .01$).

D. DISCUSSION

The results appeared to lend additional support to the notion that the social-motivational, censure-deficit model is in need of modification. Different styles of dealing with anxiety-arousing, censorious interpersonal interactions regardless of the arousing person's sex,—i. e., withdrawal (process Ss) or increased motivation (reactive and normal Ss)—could account for these findings. Recent research (2) has suggested the likelihood of such an explanation. In the present experiment, the examiner's sex may have been less relevant than the Duke studies (6) and Lefcourt *et al.* (3) have maintained. Early experiences with different types of maternal control (2) or nurturance (4) may be a crucial factor in dealing with later interpersonal anxiety.

These early experiences may be similar for male reactive schizophrenics and normals; the process schizophrenics, however, may have had quite different maternal care. In this study, reactives behaved more like normals than like process patients; when censored, the first two groups improved, while the third showed a decrement.

REFERENCES

1. FONTANA, A. F., KLEIN, E. B., & CICCHETTI, D. V. Censure sensitivity in schizophrenia. *J. Abn. Psychol.*, 1967, **72**, 294-302.
2. HEILBRUN, A. B. Distinctiveness of maternal control: A further link in a theory of schizophrenic development. *J. Nerv. & Ment. Dis.*, 1972, **154**, 49-59.
3. LEFCOURT, H. M., STEFFY, R. A., BUCKSPAN, B., & ROTENBERG, F. Avoidance of censure by process and reactive schizophrenics as a function of examiner's sex and type of task. *J. Gen. Psychol.*, 1968, **79**, 87-96.
4. MAGARO, P. A., & HANSON, B. A. Perceived maternal nurturance and control of process

² Student *ts*; all comparisons two-tailed.

- schizophrenics, reactive schizophrenics, and normals. *J. Consult. & Clin. Psychol.*, 1969, **33**, 507.
5. PHILLIPS, L. Case history data and prognosis in schizophrenia. *J. Nerv. & Ment. Dis.*, 1953, **117**, 515-525.
 6. RODNICK, E. H., & GARMEZY, N. An experimental approach to the study of motivation in schizophrenia. In M. R. Jones (Ed.), *Nebraska Symposium on Motivation*. Lincoln: Univ. Nebraska Press, 1957. Pp. 109-184.
 7. WEBB, W. W. Conceptual ability of schizophrenics as a function of threat of failure. *J. Abn. & Soc. Psychol.*, 1955, **50**, 221-224.
 8. WECHSLER, D. The Measurement and Appraisal of Adult Intelligence (4th ed.). Baltimore: Williams & Wilkins, 1958.

Department of Psychology
220 Wolf Hall
University of Delaware
Newark, Delaware 19711

HOSTILE VERB USE BY YOUTHFUL MALE PRISONERS WITH SINGLE VS. MULTIPLE OFFENSES*

Saint Elizabeths Hospital¹ and Appalachian State University

HOYT MELVYN GILLEY AND DAVID CULLEN PERKINS

SUMMARY

The present study compared the use of hostile verbs by youthful male prisoners with single offenses and those with multiple offenses. Ss chose between using a neutral verb (e. g., "visited") or a hostile verb (e. g., "killed") in constructing each of a series of 100 sentences. Ss with multiple offenses used hostile verbs significantly more than Ss with single offenses, and these differences were evident over all blocks of trials. There was a significant linear trend in hostile verb use for both groups. Implications for clinical research were discussed.

A. INTRODUCTION

A list of operationally defined hostile and neutral verbs was first used in an experiment by Buss and Durkee (2). They found that male Ss used more hostile verbs (e. g., "killed") than neutral verbs (e. g., "visited"), both initially and over reinforced trials, than did female Ss. Cultural difference in expression of hostility for males and females was given as the reason for these findings. Gilley (4) found that the presence of a female experimental confederate emitting hostile verbs served to lower response inhibition in female Ss. Gilley and Summers (5) found that in the absence of reinforcement, and without a female experimental confederate, male Ss emitted more hostile verbs over trials than did female Ss. The original findings of Buss and Durkee (2) were supported, as well as their idea that cultural training in hostile expression differs for the two sexes.

The studies cited above used "normals" (college students) as Ss and focused on sex differences in hostile expression. The purpose of the present study was to relate use of hostile verbs to a measure of overt hostility. In a previous study Wagner (6) found that juvenile delinquents gave more hostile

* Received in the Editorial Office on February 21, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This study was done while the first author was at Appalachian State University.

responses than "normals" on the Hand Test, a verbal measure of hostility and aggression (1). The present study was designed to compare hostile verb use by youthful male prisoners with single offenses and those with multiple offenses. It was predicted that these two groups would present differing levels of verbal hostility, as well as their (documented) levels of overt hostility, just as the "normal" and "delinquent" groups differed in Wagner's study.

B. METHOD

1. *Subjects*

The Ss were 40 youthful male offenders at Watauga Prison Camp in Boone, North Carolina. They ranged in age from 17-21 years ($\bar{X} = 18.73$ years), and in education level from 5-12 grades ($\bar{X} = 9.38$ grades). There were 26 white prisoners and 14 black prisoners. The prisoners were serving terms for one or more of the following 14 offenses: Assault, Assault on Female, Breaking and Entering, Carrying Concealed Weapon, Driving Under Influence, Driving While License Revoked, Escape, Hit and Run, Larceny, Obstructing Justice, Public Indecent Exposure, Receiving Stolen Property, Reckless Driving, and Trespassing.

Prisoners serving terms for one count of one offense comprised the Single Offender group in this study (20 Ss). Prisoners with more than one offense, or more than one count of the same offense, comprised the Multiple Offender group (20 Ss).

2. *Experimental Design*

A 2×5 analysis of variance (3) was performed on the data. The variables were (a) Single *vs.* Multiple Offenders and (b) Blocks of Trials.

3. *Procedure*

Subjects were given the following instructions: "This is a sentence construction task, an experimental measure of intellectual flexibility. I am going to present to you a series of cards. Each card has at the top a pronoun, and below that are two verbs. Your task is to make up a sentence which begins with the pronoun and uses one of the two verbs. The same verbs will occur repeatedly, but the idea of the task is for you to make up different sentences even though you might have to use the same verbs. When I tell you to begin, turn to the first card and make up a sentence. When you have finished one card, go on to the next card. Be careful not to skip any cards. Any questions before we begin?"

The material for the task consisted of a deck of 100 3" \times 5" unruled

index cards held together by ring binders. The cover card was entitled "Sentence Construction Task." Each card had a pronoun at the top ("I" or "We"). Below the pronoun, each card had a hostile verb (e. g., "killed") and a neutral verb (e. g., "began"). Buss and Durkee's (2) original list of hostile and neutral verbs was used. There were five blocks of 20 trials. Each block of trials contained the same 20 neutral and 20 hostile verbs, but with different pairings and in randomized order. The same male *E* (D.C.P.) was used for all prison *Ss*. The *E* made a concerted effort to maintain a "neutral" composure both before and during the task.

C. RESULTS

The Multiple Offenders used more hostile verbs over each block of trials than did the Single offenders, as shown in Table 1. The difference between the two groups in overall use of hostile verbs was significant at the .05 level

TABLE 1
AVERAGE NUMBER OF HOSTILE VERBS OVER BLOCKS OF 20 TRIALS

Group	I	II	Trial block III	IV	V
Multiple Offenders	11.10	10.55	10.90	11.30	11.75
Single Offenders	8.20	9.20	9.90	10.15	9.70

($F = 5.23$, 1 and 38 *df*). The average number of hostile verbs over 100 trials was 55.60 for Multiple Offenders and 47.15 for Single Offenders.

There was a significant Trials effect ($F = 3.03$, 4 and 152 *df*). This was accounted for by a significant upward linear trend of the trial means ($F = 11.25$, 1 and 152 *df*). The interaction of Single *vs.* Multiple Offenders \times Trials was not significant ($F = 1.90$, 4 and 152 *df*).

D. DISCUSSION

The present findings confirmed the hypothesis that verbal hostility, as measured by use of hostile verbs, is related to an operationally defined degree of "acting out" in male prisoners. No attempt was made to rate severity of offense and relate this systematically to the dependent variable; this could be a subject for future study. It is interesting to note, however, that the *S* using the highest number of hostile verbs was a Multiple Offender charged with "Assault on Female; Reckless Driving," while the *S* with the lowest number of hostile verbs was a Single Offender with a "Trespassing" charge.

The use of hostile verbs by male prisoners was higher than that found in

male college students in a previous study (5), although a definitive normative comparison cannot be made, since these two groups would also differ in socioeconomic status and level of education. Also, the college males were virtually all white, while 35% of the prisoners were black. This probably reflects, in part, the socioeconomic biases of the institutions. It should be noted, however, that in the present study there were no significant differences between black prisoners ($n = 14$) and white prisoners ($n = 26$) in hostile verb use ($t = .96$, with 38 df).

Extensions of the present research to other institutional populations, such as mental hospitals, may provide insight into the relationship between verbal hostility and other behaviors. Further studies of a normative nature could possibly provide mechanisms for diagnostic screening, prediction of acting-out potential, and evaluation of different therapeutic approaches. The brevity and ease of administration and scoring make the list of hostile and neutral verbs, as used in this study, a potentially valuable tool for clinical research.

REFERENCES

1. BRICKLIN, B., PIOTROWSKI, Z., & WAGNER, E. The Hand Test: A New Projective Test with Special Reference to the Prediction of Overt Aggressive Behavior. Springfield, Ill.: Thomas, 1962.
2. BUSS, S., & DURKEE, A. Conditioning of hostile verbalizations in a situation resembling a clinical interview. *J. Consult. Psychol.*, 1958, **22**, 415-418.
3. EDWARDS, A. L. Experimental Design in Psychological Research. New York: Holt, Rinehart & Winston, 1962. Pp. 233-238.
4. GILLEY, H. M. Effects of vicarious verbal stimuli on conditioning of hostile and neutral verbs. *J. of Psychol.*, 1969, **71**, 245-252.
5. GILLEY, H. M., & SUMMERS, C. S. Sex differences in the use of hostile verbs. *J. of Psychol.*, 1970, **76**, 33-37.
6. WAGNER, E. The Hand Test: Manual for Administration, Scoring, and Interpretation. Akron, Ohio: James, 1962.

Nichols Division
Saint Elizabeths Hospital
Washington, D. C. 20032

SIMILARITY, CONDITIONED AFFECT, AND INTERPERSONAL ATTRACTION*¹

University of Missouri

RUSSELL G. GEEN AND DAVID STONNER

SUMMARY

Fifty-four female subjects participated in a study designed to measure effects of similarity on attraction toward another girl. Positive, neutral, or negative affect was first classically conditioned to the girl's first name, after which the girl was made to appear similar or dissimilar to the subject in beliefs and attitudes. The girl was rated as more attractive when she was similar to the subject than when she was dissimilar. In addition, the effects of similarity and prior conditioning interacted.

A. INTRODUCTION

A powerful determinant of interpersonal attraction is the degree to which people perceive others as being similar to themselves in beliefs and values (2). When a subject is informed that a fictitious person agrees with him on some proportion of a number of attitude statements, it is generally found that liking for the other person varies directly with the proportion of beliefs from the entire set on which this person and the subject agree. Because the other person is hypothetical, he has no known characteristics other than similarity to the subject. However, other studies have shown that when another person is made to appear not only similar or dissimilar to the subject, but also relatively attractive or unattractive, the direct relationship of similarity to liking does not hold. Novak and Lerner (6) found that when a subject's partner in an experimental session was described as normal, the subject was more willing to interact with a similar partner than with a dissimilar one. When the partner was said to be emotionally disturbed, the subject preferred a dissimilar partner to a similar one. Taylor and Mettee (7) showed that a female who behaved obnoxiously was liked more by the subject

* Received in the Editorial Office on March 1, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This study was supported by Grant GS 2748 from the National Science Foundation to the first author.

ject when she was dissimilar than when she was similar, although a pleasant girl was liked more when she was similar than when she was dissimilar. Cooper and Jones (3) likewise found that subjects are motivated to dissociate themselves from people who are similar to them but behave in offensive ways.

Apparently the similarity-dissimilarity variable interacts with other variables relevant to a pleasantness-unpleasantness dimension in human behavior. Recent studies on classical conditioning (4, 5) suggest that one way in which people may acquire pleasant or unpleasant properties in the eyes of others is through their being associated with stimuli having positive or negative value. Possibly a person who is regarded as unpleasant because of past associations with unpleasant stimuli will, when described as similar to a subject, be rejected in the same way as someone who is regarded as unpleasant because of his behavior. The purpose of the present study was to discover whether the similarity or dissimilarity of other people to a subject will lead to their being liked or rejected when combined with positive or negative characteristics previously acquired through classical conditioning.

B. METHOD

1. *Subjects and Design*

Fifty-four female undergraduate students in introductory psychology classes at the University of Missouri served as subjects. Each subject received a point applicable to her course grade for participating. Subjects were recruited by telephone from class enrollment lists, and no girl with the first name of either "Nancy" or "Jane" was recruited. Because it was necessary that none of the three girls participating in any one session know one another, caution was taken that girls from the same living unit or the same introductory class section were not scheduled for the same hour.

The experiment was designed as a $3 \times 3 \times 2$ with three levels of conditioning (favorable, unfavorable, and neutral words associated with the name "Nancy") and three levels of manipulated similarity ("Nancy" was made to appear similar or dissimilar, or no information regarding similarity was given). Two groups of three subjects each were run in each of the nine resulting conditions. Because groups were nested within the two main orthogonal variables, the groups term in subsequent analysis of variance was used as the error term in testing main effects for conditioning and similarity and the interaction between them.

2. *Pretesting*

The adjectives used in this experiment were selected from lists provided by 115 female undergraduate students enrolled in a course in social psychol-

ogy. The generation of word lists was preferred to use of some pre-existing list (e. g., 1) so that norms for pleasantness and unpleasantness of the words would be derived from the population from which our subjects would eventually be drawn. Each student was asked to make a list of the most pleasant adjectives she could think of that could be used to describe a person, the least pleasant she could think of, and as many that were neither especially pleasant or unpleasant as she could imagine. The 15 words that appeared on the greatest number of lists in each category were selected for use in the experiment. A total of 267 words appeared on more than one list of "pleasant" words. The 15 words appearing on the greatest number of lists are given in Table 1 along with the frequencies of their being given. Similarly, 198 words appeared on more than one respondent's list of "unpleasant" words; the 15 most frequent words and their frequencies of citation likewise appear in Table 1. Only 65 words appeared on more than one list of words designated

TABLE 1
WORDS SELECTED FOR USE IN STUDY WITH FREQUENCIES
OF OCCURRENCE IN PRETESTING

Positive	f	Negative	f	Neutral	f
truthful	34	dishonest	31	short	15
gentle	31	ruthless	30	thin	15
warm	29	cruel	29	tall	14
reliable	28	rude	27	quiet	13
honest	28	greedy	27	relaxed	12
trustworthy	26	sloppy	25	small	11
friendly	25	sneaky	25	young	10
conscientious	25	cold	25	confident	9
honorable	24	lazy	25	healthy	8
sympathetic	21	disloyal	24	logical	8
good	20	unfair	22	excitable	7
polite	20	treacherous	20	objective	7
generous	19	violent	16	light	6
forgiving	17	cunning	15	trained	5
compassionate	16	offensive	15	early	5
	13		12		4

as neither pleasant nor unpleasant, and the frequencies of the 15 words most often cited are relatively low, as Table 1 shows. Five of these neutral words appeared on from one to three lists of pleasant words (healthy, logical, relaxed, quiet, and objective), while one (excitable) appeared on two lists of unpleasant words. We found no overlap between the "pleasant" and "unpleasant" lists: none of the top 15 words on either list appeared on the other.

Girls' first names were presented to the same class for judgments of attractiveness. A list of 25 names was given, and female class members were asked

to rate the attractiveness of each name of a seven-point scale. Ratings of the name "Nancy" had a mean of 4.23 with a standard deviation of 1.05. Ratings of the name "Jane" had a mean of 3.90 and a standard deviation of 1.18. These two means were closer to the midpoint of the scale (4.00) than the means for any other of the 25 names. Furthermore, the standard deviations of the ratings for these names were not significantly different from the standard deviations of the ratings for any of the other 25 names. We concluded that the names "Nancy" and "Jane," of the 25 tested, elicited the least feeling of strong liking and dislike. The name "Nancy" was chosen as the one to be systematically paired with pleasant or unpleasant words, as well as to be given to a girl who later appeared to be similar or dissimilar to the subject. The name "Jane" was chosen to be given to another girl neither systematically associated with any stimuli nor made to seem similar or dissimilar to the subject.

3. Procedure

The experimenter met the three girls to be run in the session outside the laboratory and asked whether any of the girls knew one another. He explained that since the experiment involved the way people form impressions of one another, it was necessary that the girls know nothing about one another, even names. After ascertaining that the girls were strangers to one another, the experimenter isolated each girl in a booth in the laboratory out of sight of the other two. All instructions were on tape and presented to the girls via headphones. The girls were told that the experiment was one on impression formation, and consisted of two parts. In the first they would attempt to learn to associate the names of girls with women's residence halls at the university under distracting conditions. The distraction would be words presented orally by the experimenter's assistant while the names of girls and dormitories were being shown visually. The stimuli were then projected from slides upon a screen visible to all three subjects. Each slide was presented for three seconds, with girls' names and dormitory names interspersed. As each name appeared, the experimenter's assistant, a male never seen by the subjects, pronounced an adjective which the subjects heard over the earphones. The adjective was either a pleasant one, an unpleasant one, or a neutral one (see Table 1). A total of 15 trials was run, with a different adjective paired with each name on each trial.

The first independent variable was introduced by means of this procedure. For subjects in one-third of the groups (Positive Conditioning) the name "Nancy" was paired with pleasant words on 13 of 15 trials and with neutral

words on the other two. For another third (Negative Conditioning) the name "Nancy" was paired with unpleasant words on 13 trials and with neutral words on the other two. For the final third (Neutral Conditioning) the name "Nancy" was paired with neutral words on 13 trials, with a pleasant word on one trial, and an unpleasant word on one trial. Each other name on the list was paired with pleasant, unpleasant, and neutral words approximately one-third of the time according to a random assignment of words to trials. A test trial followed the 15 conditioning trials in order to sustain the deception, after which the second part of the experiment was begun.

Each cubicle contained a terminal from a modified Crutchfield apparatus consisting of three rows of five red lights, a row of five toggle switches, and an amber "ready" light. Slots were provided so that each row of lights could be labeled with a name card. The experimenter entered each cubicle and attached to each slot a card bearing a girl's first name written in pencil. To the first row was affixed a card bearing the subject's name, to the second a card with the name "Nancy" on it, and to the third a card with the name "Jane" (a name not previously encountered in the experiment). Each subject was told that the second part of the experiment would consist of a simulated group discussion in which each would express agreement or disagreement or disagreement with an opinion statement shown on the screen. The experimenter explained to each subject that she should respond when her amber "ready" light went on and that her own opinion as well as those of the other girls would be registered on either the first or fifth of the red lights in the row bearing that person's name. The first light was said to signal agreement with the opinion statement, and the fifth light disagreement. Each girl's "ready" lamp went on simultaneously so that each girl replied first on every item. The experimenter also knew whether each of the three subjects agreed or disagreed with any statement, since each subject's response could be observed from the experimenter's terminal. The experimenter also controlled the information reaching each subject regarding how "Nancy" and "Jane" had voted, since these two nonexistent persons always voted after the subject.

This procedure allowed the experimenter to introduce the second independent variable by manipulating the degree to which "Nancy" apparently agreed or disagreed with the subject. One-third of all subjects were led to believe that "Nancy" agreed with them on 10 of the 12 items, while another third were told that "Nancy" agreed on only two of the 12 statements. The first treatment will be referred to as the Similar treatment, and the second as the Dissimilar. "Jane" agreed with the subject on six items and disagreed

on six. One-third of the subjects did not take part in the phase of the experiment described here but merely sat in the cubicle for approximately five minutes, the amount of time required for the "group discussion" in the other conditions. This No Treatment condition was added so that effects of conditioning on attraction could be assessed in the absence of manipulated similarity-dissimilarity.

Subjects were then given two copies of a questionnaire by which they could express their impressions of the other two girls on the basis of what was known about them. The questionnaire contained the items from Byrne's Interpersonal Judgment Scale (2) plus one item asking the subject to rate the degree to which "Nancy" and "Jane" were similar to herself. The latter was a check on the effectiveness of the manipulation of similarity-dissimilarity, while the Byrne scales were the means by which the subject expressed her liking for the other two girls. The experiment was concluded by an interview designed to determine whether the deceptions had been successful and whether the subjects could verbalize the fact that certain types of words were systematically paired with the name "Nancy." Finally, the experimenter explained the true nature of the experiment.

C. RESULTS AND DISCUSSION

1. *Demand Characteristics*

Although most of the 54 subjects expressed some suspiciousness over the nature of the experiment, none could verbalize either the connections between adjectives and the name "Nancy" or the fact that agreement and disagreement were being manipulated. Several of the subjects reported afterwards that the large number of names and adjectives used, as well as the rapidity with which stimuli were presented, effectively forestalled their being able to discover the pattern in which names and adjectives were paired. In the case of neither independent variable, therefore, need we assume that subjects' behavior was under the control of demand characteristics created by awareness of what we were manipulating.

2. *Effectiveness of the Similarity Manipulation*

Similarity was rated on a seven-point scale with a low score indicating high similarity. The mean rated similarity of "Nancy" was 2.00 following information that she had agreed with the subject on 10 of 12 attitude items, and 3.72 after she had agreed on two of 12. This difference is significant ($t = 3.31$, $df = 34$, $p < .01$). We may conclude, therefore, that our treatment for inducing degrees of perceived similarity was successful.

3. *Interpersonal Attraction*

Ratings of "Jane" did not reveal any significant differences resulting from treatments on any of the scales. Ratings of "Nancy" produced significant differences across treatments only for data from the scale measuring how much the subject liked the other girl. These data, with a low scale score indicating liking, are shown in Table 2. The data were analyzed by means of the analysis of variance. The main effect for Similar-Dissimilar treatment was significant, showing that, overall, "Nancy" was liked more when she was perceived by the subject as holding beliefs similar to those of the subject

TABLE 2
MEAN RATED LIKING FOR "NANCY"

Treatment	Positive	Conditioned affect	
		Neutral	Negative
Similar	1.33	3.00	3.50
No Treatment	3.67	3.33	2.50
Dissimilar	5.17	4.67	2.50

than when not ($F = 4.75$, $df = 2/9$, $p < .05$). Further support for this conclusion is found in a comparison between the Similar and Dissimilar treatment conditions when the subject received Neutral Conditioning. With prior conditioning thus controlled, "Nancy" was liked more when similar to the subject than when dissimilar ($t = 2.79$, $df = 10$, $p < .05$).

The main effect for conditioned affect was not significant ($F = 1.49$, $df = 2/9$), having been cancelled out by the interaction described below. However, a different check on the effectiveness of the conditioning treatment gives some support to our belief that association of pleasant or unpleasant words with a name produces liking or dislike for a person bearing the name. The difference between the Positive Conditioning/No Treatment and the Negative Conditioning/No Treatment means attained significance but at only a borderline level ($t = 1.95$, $df = 10$, $p < .05$, one-tailed).²

Scale scores of liking for "Nancy" also revealed a significant interaction between the conditioning and similarity treatments ($F = 4.29$, $df = 4/9$, $p < .05$). A similar other to whose name positive affect had been conditioned was preferred to a similar other to whose name negative affect had been conditioned ($t = 4.42$, $df = 10$, $p < .01$). This finding supports one of the main predictions of the study. Support for the other prediction is equivocal. When the other girl was dissimilar to the subject, she was liked slightly more

² The use of a one-tailed test is justified by the authors' prediction of a conditioning effect independent of a similarity effect.

after negative affect had been conditioned to her name than after conditioning of positive affect. The difference in liking between the two conditions, however, reached only a borderline level of significance ($t = 2.04$, $df = 10$, $p < .05$, one-tailed).

The results of the present study are thus consistent with the argument that similarity in beliefs and attitudes promotes interpersonal attraction. This is best shown in the data for subjects who had heard the name "Nancy" associated with neutral words and thus cannot be expected to have had any strong classically acquired feelings for her. These subjects liked "Nancy" significantly more when the latter was similar than when she was dissimilar. Marginal support was found for our expectation that attraction is affected by prior association of a person's name with pleasant or nonpleasant stimuli.

More interesting is the interaction between the valence of the acquired affect and the perceived attitudinal similarity of the other person. This interaction indicates that the relationship of similarity to attraction is not independent of previously existing feelings toward the other person and that such previously acquired feelings provide a setting against which the similarity or dissimilarity is perceived. This finding is generally consistent with the previously cited studies by Novak and Lerner (6) and Taylor and Mettee (7). Interpersonal attraction is a function of the interaction between perceived similarity of the other person and characteristics that make him pleasant or unpleasant; the pleasantness-unpleasantness need not result from the other's behavior but may be the product of previous conditioning.

REFERENCES

1. ANDERSON, N. H. Likeableness ratings of 555 personality-trait words. *J. Personal. & Soc. Psychol.*, 1968, 9, 272-279.
2. BYRNE, D. An Introduction to Personality. Englewood Cliffs, N. J.: Prentice-Hall, 1966.
3. COOPER, J., & JONES, E. E. Opinion divergence as a strategy to avoid being miscast. *J. Personal. & Soc. Psychol.*, 1969, 13, 23-30.
4. GRIFFIT, W., & GUAY, P. "Object" evaluation and conditioned affect. *J. Exper. Res. Personal.*, 1969, 4, 1-8.
5. LOTT, A. J., BRIGHT, M. A., WEINSTEIN, P., & LOTT, B. E. Liking for persons as a function of incentive and drive during acquisition. *J. Personal. & Soc. Psychol.*, 1970, 14, 66-67.
6. NOVAK, D. W., & LERNER, M. J. Rejection as a consequence of perceived similarity. *J. Personal. & Soc. Psychol.*, 1968, 9, 147-152.
7. TAYLOR, S. E., & METTEE, D. R. When similarity breeds contempt. *J. Personal. & Soc. Psychol.*, 1971, 20, 75-81.

Department of Psychology
University of Missouri-Columbia
Columbia, Missouri 65201

BIRTH ORDER, VOLUNTEERING, AND STATUS OF THE EXPERIMENTER: A NEGATIVE NOTE*¹

State University of New York, College at Oswego

PAUL A. ROODIN AND GLEN M. VAUGHT

SUMMARY

The effect of birth order and status of the experimenter on volunteering for a psychological experiment was investigated. Subjects were 276 undergraduates (120 firstborn and 156 later born). Volunteering was not significantly affected by either birth order or status of the experimenter for males or females. These data were discussed in terms of two recent hypothesis: (a) population shifts (b) date of publication of negative results.

A. INTRODUCTION

Considerable research has been directed at examining the relationship between birth order and personality (8, 10). One frequently reported result is that firstborns are more susceptible to social pressure and are often disproportionately represented in studies that have selected population samples from volunteers (1, 2, 10). Schooler (9) in a recent review hypothesized that by the middle 1960's, changing population trends had attenuated many prior birth order and personality relationships. Some support for Schooler's hypothesis can already be found when the date of publication of studies reporting a relationship between birth order and susceptibility to social influence is examined. Warren's review (10) reports a positive relationship between these two variables. More recent research has not tended to support the predicted relationship between birth order and susceptibility to social influence. Sampson and Hancock (7) reported that firstborn males were more susceptible to social pressure than later borns. For females, however, no relationship was found. Eysenck and Cookson (3) reported that there were no differences between first and later borns on sociability as measured by teacher ratings for both girls and boys. Moran (5) reported a positive relationship between

* Received in the Editorial Office on March 14, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Appreciation is expressed to Martha Hare, Noel Harradine, and Laraine Sullivan for their assistance in collecting the data.

ordinal position and scores on the Marlowe-Crowne Social Desirability Scale: Both firstborn males and females obtained significantly higher scores than later borns. Thus, although earlier studies were supportive of the relationship between birth order and susceptibility to social pressure, results of more recent studies are equivocal. The present study was designed to examine the effects of birth order on volunteering in order to clarify some of the above inconsistencies. In addition, recent research (6) has suggested that birth order effects may be heightened or reduced as a function of the status of the experimenter. Thus, in the present investigation the status of the experimenter soliciting undergraduate volunteers was also varied: (a) professor, (b) graduate student, (c) undergraduate student.

B. METHOD

1. Subjects

The subjects were 276 undergraduates (203 females and 73 males) enrolled in three different sections of Child Psychology at State University College at Oswego. There were 90 firstborn females and 30 firstborn males, while there were 113 later born females and 43 later born males. Excluded from the sample were only born children, twins, and those with half-brothers or -sisters. There was no control for family size.

2. Procedure

On the first day of class a female experimenter, (either an undergraduate, a graduate student, or a professor) went into one of the respective classes along with the scheduled instructor. The scheduled instructor announced to the class that before beginning to discuss the course, he would like the class to listen to Miss _____. In each class the experimenter then read the following instructions after distributing forms that asked for each student's name, ordinal position, and willingness to volunteer for a psychological experiment:

I'd like you to help me today by filling out the forms I've just passed around. My name is _____, and I'm (an undergraduate major, graduate student, professor) in the Psychology Department. I'll be conducting a psychology experiment this semester. I can't tell you about the experiment, but I do need volunteers to serve as subjects. Would you please take the forms I've just given to you and fill them in completely, leaving nothing blank. Be sure to indicate if you do or do not want to help me in my experiment. If you do, I'll be contacting you during the semester.

The class and instructor were then thanked for their cooperation, and the experimenter left the room.

C. RESULTS

The overall results of volunteering as a function of birth order and status of the experimenter are presented in Table 1. Chi square analyses indicated no significant differences in volunteering as a function of birth order for the undergraduate experimenter ($\chi^2 = .12$; $df = 1$; ns), graduate experimenter ($\chi^2 = .10$; $df = 1$; ns), or professor as experimenter ($\chi^2 = .07$; $df = 1$; ns). Similarly no significant differences in volunteering were found for first-borns as a function of status of the experimenter ($\chi^2 = 2.01$; $df = 2$; ns.) or for later borns ($\chi^2 = 3.59$; $df = 2$; ns.). Since females were overrepresented in the sample, separate analyses were conducted for each sex. There were no significant differences in volunteering as a function of ordinal position for females ($\chi^2 = .02$; $df = 1$; ns.) or for males ($\chi^2 = .55$; $df = 1$; ns.). There were no differences in volunteering as a function of status of the experimenter when the performance of first *vs.* later born females was assessed ($\chi^2_{\text{undergraduate}} = .06$; $\chi^2_{\text{graduate}} = .43$; $\chi^2_{\text{professor}} = .10$; $df = 1$; ns.). Similar nonsignificant results were obtained for males ($\chi^2_{\text{undergraduate}} = .02$; $df = 1$; ns), but because of the small sample size no analyses were possible for either the graduate or professor as experimenter conditions.

D. DISCUSSION

Unlike some earlier studies, no significant effects of birth order on volunteering for a psychological study were obtained. Nor was there any effect of status of the experimenter and birth order on volunteering. The inability to obtain any relationship between birth order and volunteering apparently supports Schooler's (9) hypothesis that such effects may be, in part, due to long-term population changes. However, Schooler's results hold primarily for males. With the large proportion of females in the present investigation, Schooler's conclusion may be extended to females also. Birth order effects on volunteering were assessed separately by sex, a control often neglected in this type of research. However, since no significant differences were obtained, it appears that sex may be relatively unimportant for some variables. The data also suggest that perhaps investigators need not be so concerned about

TABLE 1
EFFECTS OF BIRTH ORDER AND STATUS OF EXPERIMENTER ON
VOLUNTEERING (NUMBERS OF SUBJECTS)

Status	Firstborn		Later born	
	Yes	No	Yes	No
Professor	28	20	34	26
Graduate	20	7	28	9
Undergraduate	27	18	37	22

biases resulting from samples selected from volunteers. With recent guidelines for ethical considerations in research using human subjects, such volunteer populations are likely to be used more frequently.

It should also be noted that Schooler's hypothesis of population shifts may be viewed from an alternative position. Positive results in psychological research may be more likely to be published earlier than negative results. Such a date of publication hypothesis is well-documented in many areas of psychological research. Fleming and Anttonen (4), for example, allude to such a hypothesis in their review of research relating to teacher expectancy and school performance.

The failure to find any effect of status of the experimenter on volunteering was also not anticipated. It was expected that a high status experimenter would heighten the predicted effect of birth order on volunteering. Perhaps subjects were relatively unaware of this variable, since the status of the experimenter was not stressed in the instructions. Undoubtedly a within-subjects design would provide a better technique of assessment. An alternative explanation suggests that since the female experimenters were fairly similar in terms of age and physical appearance, status may not have been effectively manipulated.

REFERENCES

1. ALTUS, W. D. Birth order and its sequelae. *Science*, 1966, **151**, 44-49.
2. CAPRA, P. A., & DITTES, J. E. Birth order as a selective factor among volunteer subjects. *J. Abn. & Soc. Psychol.*, 1962, **64**, 302.
3. EYSENCK, H. J., & COOKSON, D. Personality in primary school-children: 3. Family background. *Brit. J. Educ. Psychol.*, 1969, **40**, 117-131.
4. FLEMING, E. S., & ANTONEN, R. G. Teacher expectancy as related to the academic and personal growth of primary-age children. *Monog. Soc. Res. Child Devel.*, 1971, **36**, 5 Serial No. 145.
5. MORAN, G. Notes and comments: Ordinal position and approval motivation. *J. Consult. Psychol.*, 1967, **31**, 319-320.
6. ROODIN, P. A. Birth order and cooperativeness: Peer ratings. *Psychol. Rep.*, 1971, **29**, 590.
7. SAMPSON, E. E., & HANCOCK, F. R. An examination of the relationship between ordinal position, personality, and conformity: An extension, replication, and partial verification. *J. Personal. & Soc. Psychol.*, 1967, **5**, 398-407.
8. SCHACHTER, S. *The Psychology of Affiliation*. Palo Alto Calif.: Stanford Univ. Press, 1959.
9. SCHOOLER, C. Birth order effects: Not here, not now! *Psychol. Bull.*, 1972, **78**, 161-175.
10. WARREN, J. A. Birth order and social behavior. *Psychol. Bull.*, 1966, **65**, 38-49.

Department of Psychology
SUNY College at Oswego
Oswego, New York 13126

PSYCHOLOGICAL NEEDS OF SUBURBAN MALE HEROIN ADDICTS*¹

Demographic and Special Studies Unit, Central Islip State Hospital, New York

CHARLES SHEPPARD, ELIZABETH RICCA, JOHN FRACCHIA,
AND SIDNEY MERLIS

SUMMARY

The Edwards Personal Preference Schedule (EPPS), an objective test of Murray's theory of personality development, was completed by 51 male applicants to a county methadone maintenance program.

Tests of significance (t) were applied to the suburban heroin addict sample ($n = 51$) and to the general adult male normative sample ($n = 4031$) data to determine if they scored differently on the 15 EPPS psychological need constructs. Because of the disproportionate sample sizes, a hypothetical sample ($n = 51$) was drawn from the normative sample for comparative purposes.

Questions raised in these analyses were the following: Do heroin addicts differ in psychological need structure from the general adult male population? What motivates and directs behavior? What are the factors leading to the psychological availability to abusing drugs? What may make addicts resistant to psychotherapy?

A. INTRODUCTION

Drug abuse has been an episodic problem in our society. In some of the metropolitan areas of the country, drug abuse has reached epidemic proportions. Recent efforts designed to eliminate drug availability are beginning to show strong positive results with regard to relocating the problem as well as reducing the number of new addicts. Treatment programs remain problematic (3).

* Received in the Editorial Office on March 20, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ We are indebted to Henry Brill, M. D., Chairman, Lawrence Kennedy, Executive Director, Alfred Howe, M. D., Medical Director, and the Suffolk County Narcotic Addiction Control Commission for their permission to collect these data. We thank Jeanne Dickoff, R. N., Rosanna Lauria, Sidney Hughes, Michael McDonough, and William Harkins of the Bay Shore Clinic for their assistance in collecting the data and, also, Solange Hall, Kathleen Reinhardt, and Dorothy Caselles of the Demographic and Special Studies Unit, Central Islip State Hospital, for their assistance in preparing this manuscript.

Currently, an ideal program will offer the applicant alternatives of detoxification with accompanying aftercare services, methadone maintenance with ancillary counseling procedures, and/or a therapeutic community approach (2). While these treatment programs have been designed to meet addicts' needs, there are few systematic efforts reported directed at delineating specifically what these needs are, especially at a less visible psychological level. Murray (4) provides a theoretical approach that may serve as a guide to understanding the psychological need structure of addicts.

The Edwards Personal Preference Schedule (EPPS) is an objective test developed from Murray's theory to measure the intensity of 15 psychological needs that motivate and direct behavior (1). One purpose of the present study was to determine if a sample of narcotic addicts scores differently from a nonaddict sample on the EPPS need constructs. The importance of these data can be viewed in terms of their direct clinical application. Also, they may be helpful in providing some basic understanding of the confluence of precipitating factors enabling development of psychological availability, which on an individual level may underlie the development of the heroin epidemic. Without this understanding, a basic vulnerability remains both for the addict and the society. Therefore, we might reasonably expect a recurrence of the drug problem in another form at some future date.

B. METHOD

Fifty-one applicants to the Suffolk County methadone maintenance program participated in an intake procedure that included an extensive social and drug history, a battery of psychometric tests, and a depth clinical interview. This paper describes and attempts to integrate data from the EPPS, Raven's (5) Standard Progressive Matrices (RPM), and certain demographic and drug history variables to approach a better understanding of addict samples.

Intake testing and interviews were conducted at the clinic on successive Fridays. There were no deviations from standard test instructions. Adequate proctoring, assistance was available at all testing sessions. No time limits were imposed. Breaks were given *ad libitum*. Applicants were permitted to return on successive Fridays until testing was completed. All were actively using drugs when tested.

The 51 participants were males. Their mean age was 23.4 years, with a standard deviation of 4.1 years. Formal education averaged 11.5 years with a standard deviation of 1.4 years. The mean RPM centile was 63, with a standard deviation of 28 percentile points indicating the group was above

average in abstract reasoning ability. The majority came from families that were at or above the economic median salary for the county during their adolescence. Most families were upwardly mobile. Thirty-nine percent came from families that could be considered as socioeconomically deprived.

Most were multiple drug abusers. The mean age of beginning of heroin use was 17.5 years with a standard deviation of 2.5 years. Most had been introduced to drug use by a friend. Forty-nine percent began with marijuana, 35 percent with some commercially produced product, and 16 percent directly with heroin. The majority were addicted before their 18th birthday, mainlining an average of five spoons four times daily, costing \$25.00 a day. Habits were supplemented with other drugs at least twice a week to reduce costs. Most reported beginning drug use out of curiosity, feelings of boredom, and/or some need for excitement.

EPPS answer sheets were scored, and means and standard deviations computed in raw score units for each of the 15 need scales and the consistency scale. These data were then compared by *t* tests of significance with the normative data for the general adult male population (1).

Because of the disproportional sample sizes—that is, the 51 cases for the present suburban addict sample as compared with the 4031 cases in the general adult male normative population—there was a bias in favor of establishing significance carried mostly by the contributions of the normative group. In attempt to neutralize this bias, a hypothetical sample of 51 cases was drawn from the normative population for comparative purposes. The constraints placed on the hypothetical sample were such that the raw score means and standard deviations on each of the EPPS constructs would be identical with those of the normative population. Tests of significance (*t*) were then reapplied to measure the significance of differences between the addict and normative samples which would reflect more conservative differences.

C. RESULTS

Means, standard deviations, sample size, and *t* and *p* values for EPPS construct raw scores on the 15 need scales and the consistency scale, comparing the addict sample with both the general male population and a hypothetical sample drawn from the normative population, are seen in Table 1. References in these analyses are made primarily to tests of significance between the addict and the hypothetical adult male sample of comparable size reported in columns 7 and 8 of the right-hand side of Table 1. These data provide more conservative estimates of the differences in psychological need structure between male addicts and the general male population.

TABLE 1
MEANS, SDs, *ts*, AND *ps* FOR EPPS SCORES COMPARING THE ADDICT SAMPLE^a WITH THE
NORMATIVE POPULATION AND A HYPOTHETICAL SAMPLE DRAWN FROM THE
NORMATIVE POPULATION

Measure	Adult male normative data							
	Addict sample (<i>N</i> = 51)		General (<i>N</i> = 4031)				Hypothetical (<i>N</i> = 51)	
	\bar{X}	<i>SD</i>	\bar{X}	<i>SD</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
Achievement	15.29	3.38	14.79	4.14	.86	NS		NS
Deference	11.53	3.39	14.19	3.91	4.84	.001	3.64	.001
Order	12.49	3.55	14.69	4.87	3.22	.01	2.58	.025
Exhibition	13.27	3.69	12.75	3.99	.93	NS		NS
Autonomy	16.37	3.49	14.02	4.38	3.82	.001	2.97	.01
Affiliation	12.35	4.30	14.51	4.32	3.55	.001	2.51	.025
Intracception	15.67	3.97	14.18	4.42	2.40	.025	1.77	NS
Succorance	12.25	4.32	10.78	4.71	2.22	.05	1.63	NS
Dominance	12.41	4.41	14.50	5.27	2.82	.01	2.15	.05
Abasement	13.45	3.97	14.59	5.13	1.58	NS		NS
Nurturance	14.51	3.91	15.67	4.97	1.66	NS		NS
Change	16.29	3.99	13.87	4.76	3.62	.001	2.76	.01
Endurance	12.65	5.22	16.97	4.90	6.26	.001	4.27	.001
Heterosexuality	16.63	4.44	11.21	7.70	5.02	.001	4.31	.001
Aggression	14.39	4.10	13.06	4.60	2.06	.05	1.53	NS
Consistency	10.49	2.34	11.35	1.96	3.11	.01	1.99	.05

^a Applicants to a county methadone maintenance program.

Suburban male heroin addicts scored significantly higher than the general male sample on scales measuring the need for heterosexuality, autonomy, and change. Addicts scored significantly lower than the general male normative sample on the need for endurance, deference, order, affiliation, and dominance. See right-hand columns 1, 3, 7, and 8 of Table 1.

D. DISCUSSION

While these data are essentially descriptive, and the present study exploratory, some general understanding of male heroin addicts can be derived within Murray's theoretical view (3). The significantly high need for autonomy, plus that for change, have mutually supportive aspects which can hinder development of mature functioning and can be satisfied in drug taking behavior.

Some aspects of autonomy measured by the EPPS include the need to be free of physical and psychological restraints; to be independent, unconventional, uninhibited; to avoid social restrictions, responsibilities, and obligations. The need for change scale taps the desire to do new and different things, experience novelty, and participate in new fads and fashions. It would

appear that the drug life style may serve some mutually supportive conditions. Certainly, the behavior is considered unconventional, produces a physiological state which at first is novel and pleasurable, and is considered by many as being in the nature of a fashionable experiment. The state produced by the drug allows for a temporary freedom from the restrictions of time, space, and place, but the drug taking exacts a penalty by imposing a demanding regulative effect on the person's life once he is addicted. While there is simultaneous satisfaction of important psychological needs, the entire process is only partially satisfying and more generally undermining. Conflict, then, is apparent in aspects of addicts' needs for autonomy and change. Instead of becoming uninhibited and independent their autonomy is thwarted by their unconventionality and irresponsibility. This may further lead to feelings of anxiety, ambivalence, and/or apathy if carried long-term.

The sex life of addicts has been reasonably well documented as chaotic. The addicts' higher need for heterosexuality in this sample is associated with a significantly lower need for affiliation when compared with the general adult male sample. Achievement of mature sexuality is likely thwarted by their lower needs to be with others, establish friendships, share and form strong attachments and be loyal. Mature sexuality requires a capacity to give as well as receive and to understand as well as be understood. Apparently, conflict exists at this level also.

The addict has been pictured as a poor candidate for psychotherapy (2). He resists psychological treatment, but will enter group therapy, especially if it is termed "rap sessions" rather than group therapy. This sample scores significantly lower than the normative sample on the need for order, which involves making plans and having things organized so they run smoothly without change. This low need for order supports addicts' stronger need for change, but may provide a source of unconscious resistance. Additionally, their lower need for endurance, expressed as the need to keep at a problem until it is solved, to complete what is undertaken, and to stick at a problem even though it may seem as if no progress is being made, may also serve to support their resistances. Lastly, in this regard their lower need to solicit others' views, avoid the unconventional, do what is expected, or follow advice is reflected in their lower need for deference. Possibly, these observations may have some application toward a more general understanding of the intrapsychic dynamics of male addicts as reflected in this sample and their possible resistances to effective treatment. Seemingly, these would need to be uncovered if understanding is a goal of treatment.

REFERENCES

1. EDWARDS, H. L. Manual for the Edwards Personal Preference Schedule. New York: Psychol. Corp., 1959.
2. GLASSCOTE, R. M., SUSSEX, J. N., JAFFEE, J., BALL, J., & BRILL, L. Treatment of Drug Abuse: Programs, Problems, Prospects. Washington, D. C.: Joint Inform. Serv. Amer. Psychiat. Assoc. & Nat. Assoc. Ment. Health, 1972.
3. HARRIS, T. G. "As far as heroin is concerned the worst is over": A conversation about the drug epidemic with Jerome Jaffee. *Psychol. Today*, 1973, **7**, 68-85.
4. MURRAY, H. A. Explorations in Personality. New York: Oxford: Univ. Press, 1938.
5. RAVEN, J. C. Guide to the Standard Progressive Matrices: A, B, C, D, and E. London: Lewis, 1960 (distributed in USA by Psychol. Corp., New York).

Research Division

Central Islip State Hospital

Central Islip, New York 11722

BODY HEIGHT, POSITION, AND SEX AS DETERMINANTS OF PERSONAL SPACE*

Department of Psychology, Virginia Commonwealth University

JOHN J. HARTNETT, KENT G. BAILEY, AND CRAIG S. HARTLEY

SUMMARY

The effects of body height, body position, and sex on personal space were investigated in a laboratory setting. Forty-one males and 43 females approached either a tall object person or a short object person with instructions to stop when they felt "uncomfortable." Subjects approached the object person twice, once with the object person in a standing position and once with the object person in a sitting position. Height and position were found to be significant determinants of personal space, while position \times sex was also significant. Results are discussed from a social as well as an ethological point of view.

A. INTRODUCTION

The concept of personal space has recently received considerable attention from social scientists (9, 15, 16, 17), who have explored spatial contingencies in a variety of situations. Much of this attention can be attributed to studies of lower animals (1, 10) demonstrating the importance of distance maintenance within species. Aggressive behavior between members of the same species is often over "territory," and Ardrey goes so far as to state that man's aggressiveness is largely based on his "innate territorial nature." Man, he argues, has an innate compulsion to gain and defend territory.

While little experimental evidence has been marshalled in support of territoriality in humans there has been an accumulation of evidence demonstrating the importance of spatial distance in human behavior. Zajonc (18), for example, showed that the mere presence of others facilitates the performance of learned tasks and has a debilitating effect on the learning of new tasks. The explanation for the relationship between task performance and the presence of others is that the presence of others raises the activation level. This interpretation is strengthened by the finding that physiological

* Received in the Editorial Office on March 21, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

changes do occur within an individual placed in close proximity to others. Mason and Brady (11) showed that the urinary concentration of hydrocortisone increased in monkeys when they were placed in a room with other monkeys; a similar increase in the hydrocortisone level was found for a hospital patient on those days he was in continual interaction with others. McBride, King and James (12) found that as subjects were approached by male and female experimenters, there was an increase in the galvanic skin response of subjects. The GSR was greater when Ss were approached by someone of the opposite sex.

At the behavioral level, Milgram (14) showed that obedience in subjects decreased as the authority figure increased his distance from the subjects and that subjects were less willing to punish the "victim" as the distance between the victim and the subject decreased. Kleck (8) had subjects listen to a confederate discuss issues of high importance under two different interaction distances. It was found that more agreeing responses were produced by subjects in the near condition. Kleck has argued that the extent to which the behavior of an individual is affected by another is a function of the distance between them. The closer the distance the stronger the stimulus characteristics associated with others are perceived.

The purpose of the present study is to examine the stimulus characteristics of "others" that may determine the amount of distance an individual maintains from them: namely, height of "others" and their bodily position. In their study of personal distance as it relates to authoritarianism and race, Frankel and Barrett (6) found distance magnitudes far in excess of those in other experimental studies. One explanation for such magnitudes could be the heights of the stimulus people in the study. Both were 6'5". Observation of animals has shown that pecking order and territory are related to size. The dominant males with their harems are usually the biggest and strongest and are therefore given a wide berth by other males. Ardrey's (1) book is replete with examples in which size and potency contribute to an animal's defense of territory, but height has not yet been studied by personal space researchers as a separate variable among human subjects.

The size of an individual has the major dimensions of height and weight, which may act in an additive or interactive fashion in determining personal space. In this study height is manipulated, with body build held constant. Body position is also examined as it relates to personal space. Ethologists continually emphasize the bodily position of animals in territorial confrontations. A defensive stance, for example, is a cue that an animal is ready to fight. That bodily positions, such as sitting or standing, would be determinants

of personal space is certainly plausible; and Haase and Markey (7) have commented that "Virtually no evidence exists which has examined differences in proxemic notation of seated and standing participants, although both methods have been widely employed" (p. 124).

It is hypothesized that (a) all subjects will approach closer to a short object person than to a tall object person, (b) all subjects will approach closer to an object person when he is sitting than when he is standing, (c) tall subjects will approach closer to the standing tall object person than will short subjects, (d) female subjects will not differ from males in approach to the short object person, but will maintain greater distances than males from the tall object person because of the greater threat response of females in a personal space situation (2, 5, 9, 13).

B. METHOD

1. *Subjects*

Eighty-four students, consisting of 41 males and 43 females, enrolled in introductory psychology classes at Virginia Commonwealth University served as subjects for course credit.

2. *Procedure*

Two male undergraduate psychology students at Virginia Commonwealth University were selected to serve as confederate object (O) persons in the experiment. Both were subjectively evaluated by the experimenters as being similar in appearance—both having moderately long hair and a mustache in the style of many of their contemporaries. One O was 6'3" tall and weighed approximately 180 pounds, while the other was 5'4" tall and weighed approximately 130 pounds. Both dressed neatly and stylishly.

Ss were asked to report to the experimental waiting room. As each S entered the waiting room, he was given an identification number which served both to identify his data and insure anonymity of its source. The S was then given a brief questionnaire asking for his age, sex, height, and weight. After completing the questionnaire, the S was asked to fill out a self-esteem inventory (3).

Upon completion of the questionnaire and the self-esteem inventory, each S was individually escorted to the experimental room. Outside the closed door to the room he was told that the purpose of the experiment was to measure how close or how far apart people prefer to be in order to feel comfortable. He was assured that "there is no deception involved in the experiment."

S was then taken into the room and shown exactly where to place his toes on the 12" strip of black tape that marked the starting point for all approaches. Once the S was properly positioned, the experimenter left the room and closed the door behind him, leaving the S facing the lone object person in the room. The object person was either sitting or standing according to the counterbalanced order required for the particular subject. The O first asked the S for his identification number and, after receiving the information, told the subject: "You are to walk toward me until you feel uncomfortable. When you feel uncomfortable, stop."

As the subject walked toward the object person, the object person looked into the S's eyes and stood or sat erect with his hands folded in his lap. Once the S stopped, the O noted as unobtrusively as possible, the stopping position of the S's nearest toe. He then told the S: "Now return to the starting line and stand facing me as you were shown with your toes on the line."

As the S returned to the starting line, the O assumed either a standing or sitting position depending on whichever was opposite to the first position tested. The approach procedure was then repeated, and the stopping position was again noted. The S was then directed to go back to the waiting room.

Upon returning to the waiting room the S was asked to fill out a semantic differential measuring the potency and evaluative dimensions of the object person he had just approached in the experimental room. When the S had completed this form, he was thanked for his participation in the experiment and was asked not to reveal the details of the experiment to any potential subjects.

A three-factor mixed experimental statistical design with repeated measures on one factor was used. The two factors being tested in combination with each other were short *vs.* tall object and male *vs.* female subject, while the repeated measures occurred in trials of sitting *vs.* standing object. Also, Pearson product-moment correlations were computed between the distances recorded for each position—standing and sitting—and the following obtained values for each S: height of S, self-esteem score, Evaluative scale average score, and Potency scale average score.

C. RESULTS

Result of the analysis of variance of the space scores reveal that the height of object main effect was significant ($F = 14.89$, $p < .001$), and inspection of the means (see Table 1) shows that the subjects tended to stop their approaches farther from the tall object person than from the short object person, as predicted.

TABLE 1
MEAN SPACE SCORES (INCHES) FOR HEIGHT OF OBJECT,
POSITION OF OBJECT, AND SEX OF SUBJECT

Variable	Short object	Tall object
Sitting object		
Male subject	7.1	10.5
Female subject	6.6	16.6
Total	13.7	27.1
Standing object		
Male subject	10.7	19.0
Female subject	8.9	26.5
Total	19.6	45.5

The position variable was also significant ($F = 25.84$, $p < .001$) with the subjects' stopping distances being greater when the object was standing than when he was sitting. Examination of the table of means demonstrates that this effect was much more dramatic with the tall object than with the short object.

A significant interaction effect was found to exist between position and height of object ($F = 7.55$, $p < .01$). The male and female Ss of the short object group approached to within very nearly the same distance of the sitting *O* with the females coming just slightly closer (6.6" vs. 7.1"). When the short *O* was standing, the females again came somewhat closer in their approaches than did the males (8.9" vs. 10.7"), although both distances were greater than those observed when the *O* was sitting. The male and female Ss of the tall object group, however, showed a reverse tendency. In this group, the females stopped much farther away than the males regardless of the *O*'s position, and the differences for all Ss between the two positions were much more pronounced (18.4" for the tall *O* vs. 5.9" for the short *O*). The analysis of variance did not show the sex of subject to have a significant effect ($F = 1.35$, $p < .25$), nor was a significant interaction found between height of object and sex of subject ($F = 2.00$, $p < .20$), although in both cases there was a definite tendency toward significance.

In the correlational analysis between personal space scores and subjects' height, self-esteem scores, Evaluative scale scores, and Potency scale averages, the only significant result was Evaluative scale average to distance to the sitting object ($r = -.356$, $p < .02$). This negative correlation means that as the subject rated the short object person higher on the evaluative scale of the semantic differential, he approached closer. This same correlation in the tall *O* group was slightly positive, although it did not approach significance ($r = .113$). The self-esteem score to distance correlation was found to

approach significance in both the sitting ($r = -.253$) and standing ($r = -.262$) positions of the tall object, with the standing position slightly significant ($p < .10$). Self-esteem had virtually no correlation with distance among Ss in the short object group ($r = .108$). The only other correlation to tend toward significance was height of S to distance to the standing O ($r = -.239$).

D. DISCUSSION

The present results are consistent with the hypothesis that height is a major determinant of personal space. Both males and females maintained twice as much distance between themselves and the tall object person than between themselves and the short object person. This is most apparent in the standing position where the mean space scores for subjects were 9.8" and 22.7" for the short and tall Os, respectively.

While the sex and height interaction was significant at only the .20 level, inspection of the table of means does show that height appeared to have more of an effect on females than males, especially in the standing condition. Since sex has been found to be a factor in personal space (2, 4), it is believed that the sex factor was not as strong in this particular study because of the experimental manipulations. In the present study there were no references to the subjects about sex or attractiveness, and this, coupled with the fact that the Os made no effort to be particularly sexually appealing, attenuated the sex variable. By contrast, Dosey and Meisels (4) told their subjects that they were to approach an object person who would evaluate their physical attractiveness. Bailey *et al.* (2) chose their object persons on the basis of physical attractiveness and thereby accentuated the sex variable.

The significance of position (stand/sit) and position \times height is of particular interest. As hypothesized, the personal space measures were far greater for the standing than for the sitting position. For both the short and tall Os, subjects approached closer in the sitting condition. From a territorial point of view, it could be that Ss believing that they were invading O's territory perceived less threat when the Os were in a noncombat (sitting) position.

That threat may have played a role is supported by the finding that even when the taller O was in the sitting condition, subjects stayed further away from him. The initial assumption was that if the attribute of height alone without its perceived concomitants determined spatial distance, then the approach toward the tall and short O would be the same for the sitting condition. However, the findings are consistent with previous studies demon-

strating that the more easily threatened females are less likely to invade someone's personal space than are males. Although subjects were not physically threatened in any way for invading O's personal space, the possibility exists that "implied threat" was activated by the instructions that they could become "uncomfortable" if they approached too close [see discussion in Bailey *et al.* (2)]. This could account for the greater distance for the tall O under both the standing and sitting conditions.

Implications of this study suggest some interesting ramifications for personal interaction with a tall individual. Kleck's finding that interpersonal influence is affected by personal space, and the closer the distance the stronger the stimulus characteristics associated with others is perceived, suggests that at decreasing distances height will become an increasing factor in personal influence. The results of the present study could then be interpreted as an attempt by Ss to mitigate the effects of the stimulus characteristics of the tall object person.

REFERENCES

1. ARDREY, R. *The Territorial Imperative*. New York: Delta, 1966.
2. BAILEY, K. G., HARTNETT, J. J., & GIBSON, F. W., JR. Implied threat and the territorial factor in personal space. *Psychol. Rep.*, 1972, **30**, 263-270.
3. COOPERSMITH, S. *The Antecedents of Self-Esteem*. San Francisco: Freeman, 1967.
4. DOSEY, M., & MEISELS, M. Personal space and self-protection. *J. Personal. & Soc. Psychol.*, 1969, **11**, 93-97.
5. DUKE, M. P., & NOWICKI, S., JR. Perceived interpersonal distance as a function of the subject's locus of control and the race and sex of stimuli in elementary and high school children. Paper presented at Southeastern Psychological Association, Miami, Florida, 1971.
6. FRANKEL, S., & BARRETT, J. Variations in personal space as a function of authoritarianism, self-esteem, and social characteristics of a stimulus situation. *J. Consult. & Clin. Psychol.*, 1971, **37**, 95-98.
7. HAASE, R. F., & MARKEY, M. J. A methodological note on the study of personal space. *J. Consult. & Clin. Psychol.*, 1973, **40**, 122-125.
8. KLECK, R. E. Interaction distance and nonverbal agreeing responses. *Brit J. Soc. & Clin. Psychol.*, 1970, **9**, 180-182.
9. LITTLE, K. B. Personal space. *J. Exper. Soc. Psychol.*, 1965, **1**, 237-247.
10. LORENZ, K. *King Solomon's Ring*. New York: Crowell, 1952.
11. MASON, J. W., & BRADY, J. V. In P. H. Leiderman & D. Shapiro (Eds.), *Psychobiological Approaches to Social Behavior*. Stanford, Calif.: Stanford Univ. Press, 1964.
12. MCBRIDE, G., KING, M. G., & JAMES, J. W. Social proximity effects on galvanic skin responses in adult humans. *J. of Psychol.*, 1965, **61**, 153-157.
13. MEISELS, M., & GUARDO, C. J. Development of Personal space schemata. *Child Devel.*, 1969, **40**, 1166-1177.
14. MILGRAM, S. Some conditions of obedience and disobedience to authority. *Hum. Relat.*, 1965, **18**, 57-76.
15. SOMMER, R. Sociofugal space. *Amer. J. Sociol.*, 1967, **72**, 654-660.

16. ———. *Personal Space: The Behavioral Basis of Design*. Englewood Cliffs, N.J.: Prentice-Hall, 1969.
17. SOMMER, R., & BECKER, F. D. Territorial defense and the good neighbor. *J. Personal. & Soc. Psychol.*, 1969, **11**, 85-92.
18. ZAJONC, R. B. Social facilitation. *Science*, 1965, **149**, 269-274.

Department of Psychology

Virginia Commonwealth University

901 West Franklin Street

Richmond, Virginia 23284

EXPRESSOR SEX, PERCEIVER PERSONALITY, AND COGNITIVE PERCEPTION*

Tennessee Technological University

BILL C. EDWARDS AND JETTIE M. McWILLIAMS

SUMMARY

The relationship between expressor sex, cognitive dimension, and personality was investigated. Male and female college students watched videotaped sessions of male and female expressors. Each expressor talked for three minutes about each of three prescribed subject areas. Perceivers then reacted to a semantic differential as they thought the expressors had previously reacted. Absolute difference scores were established for each perceiver-expressor combination indicating level of cognitive perception accuracy. High and low perceivers' personality scores were compared by *t* test. Four California Psychological Inventory variables were found to be related to accuracy of cognitive perception. Implications were discussed regarding previous findings and the need for further research.

A. INTRODUCTION

The relationship of personality characteristics to accuracy of perception seems very complex. Accuracy may depend on such variables as the kind of interpersonal judgment and the attributes of the stimulus person. It is likely, however, that some persons have achieved higher degrees of accuracy in person perception because of the convergence of a multitude of component processes and abilities related to understanding other people (6).

Investigations of interpersonal perception that attempted to identify characteristics of good and poor judges of others (4, 5, 7) found that good judges were better adjusted, less neurotic, less extroverted, and had more self-insight, social skill, and cognitive complexity than poor judges. Hjelle's (3) findings that good judges obtained significantly higher scores than poor judges on the California Psychological Inventory (CPI) scales of Psychological Mindedness, Tolerance, and Well-Being appeared to substantiate earlier findings of Vingoe and Antonoff (7). However, these studies, which dealt with perception

* Received in the Editorial Office on May 22, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

and/or judgment of personality and emotional variables, failed to take into account the sex of the judged, a shortcoming pointed out by Tagiuri (6).

Edwards, Moore, and McWilliams (2) investigated a totally different aspect of person perception—cognitive perception. They found that high accuracy judges obtained significantly lower scores on the CPI scales Dominance, Sociability, and Self-Acceptance than low accuracy judges and significantly higher scores on the Femininity scale. Although these were not the same scales as those found by Hjelle (3) to differentiate good and poor judges, the idea that certain personality variables differentiate the two groups was substantiated. These differences in findings could possibly be attributed to the different subject of judgment.

Edwards and McWilliams (1) in a later study found that expressors were perceived differently according to their sex and according to semantic dimensions. A semantic differential was used to find that female expressors were perceived more accurately in the evaluative dimension, while males were perceived more accurately in the potency and activity dimension. This study pointed clearly to the need to control expressor sex in person perception research. The present study, conducted in conjunction with the above research, was designed to investigate relationships between sex of expressors, accuracy of cognitive perception, and personality attributes of perceivers as measured by the CPI. The subjects in the literature review as well as those in this study were all North American college students.

B. METHOD

1. *Subjects*

Undergraduate students enrolled in an introductory psychology course at Tennessee Technological University participated. Students who were more than casually acquainted with expressors and those who did not satisfactorily complete the instruments were eliminated from the study. This procedure resulted in data collected on 65 male and 97 female students. One male and one female were randomly eliminated in order to achieve an exact 1 to 1½ male to female ratio for statistical purposes.

2. *Instrument*

Each of 11 expressor nominees talked before a video camera for three minutes about each of three topics—grades, family, money—which had been selected previously by undergraduate psychology classes. These 11 sessions were judged for expressiveness by an upper division undergraduate psychology class. The sessions of two female and two male expressors judged most expressive were transferred to one 36 minute videotape for presentation to Ss.

Measurement of cognitive perception was accomplished by use of a semantic differential (SD). The SD was administered to expressor nominees who had just completed the talk sessions before the video camera and, subsequently, to Ss after they had watched the video sessions. Subjects were instructed to react as they thought the expressors had reacted previously to the same instrument.

The SD consisted of the three topic-concepts (grades, family, and money) plus three concepts for masking purposes (God, life, people). The adjective pairs included good-bad and false-true, representing the evaluative dimension; active-passive and fast-slow, representing the activity dimension; strong-weak and hard-soft, representing the potency dimension.

3. Procedure

Five classes of approximately 30 students each viewed an expressor on video as he/she talked for three minutes about each of the three topics, for a total of nine minutes exposure. Subjects then reacted to the SD as they believed the expressor had previously reacted to it. This procedure was repeated for each of the other three expressors with the order of presentation of expressors randomized for each of the five groups of Ss.

Semantic differential difference scores were established by totaling the absolute difference between responses of expressors and Ss on each item. Six scores were calculated for each S—one for each of the dimensions of evaluative, potency, and activity for each expressor sex. Concepts used for masking purposes were ignored in scoring.

The California Psychological Inventory (CPI) was administered during the same quarter. The relationship of CPI personality variables to cognitive perception was analyzed for each of the six scores: male expressor/evaluative dimension, male expressor/potency dimension, male expressor/activity dimension, female expressor/potency dimension, female expressor/activity dimension, female expressor/evaluative dimension. Upper and lower accuracy groups, each comprising 27% of the total *N*, were compared by *t* test on each of the CPI variables. Perceiver sex was ignored because an earlier study (1) indicated no differences in perceiver sex.

C. RESULTS

Means and *t* ratios where significant differences were found are reported in Table 1, indicating that high and low scoring Ss differed depending on both the sex of the expressor and the semantic dimension involved.

Three CPI variables differentiated high and low perceivers of males in the *activity* dimension: Dominance, Sociability, and Achievement via Confor-

TABLE 1
MEANS AND *t* SCORES OF HIGH AND LOW ACCURACY PERCEIVER GROUPS
ON CALIFORNIA PSYCHOLOGICAL INVENTORY (CPI) VARIABLES
BY EXPRESSOR SEX AND SEMANTIC DIMENSION

CPI variable	Male expressor/activity		Accuracy group <i>t</i>	Female expressor/evaluative		<i>t</i>
	Low	High		Low	High	
Dominance	48.30	42.70	2.37*			
Sociability	48.02	42.51	2.17*			
Self-Control				45.79	40.63	2.50*
Achievement via Conformance	44.81	38.49	2.97**	45.02	38.63	2.85**

* Significant at or beyond the .05 level.

** Significant at or beyond the .01 level.

mance. The CPI variables Self-Control and Achievement via Conformance differentiated high and low perceivers of females in the *evaluative* dimension. These relationships were all negative.

D. DISCUSSION

The findings that high and low perceivers were differentiated only for the semantic dimension of activity for males and the evaluative semantic dimension for females appears to validate the previous findings of Edwards and McWilliams (1) that females were perceived most accurately in the evaluative dimension and that males were perceived most accurately in the activity dimension.

The finding that high accurate perceivers of male expressors in the activity semantic dimension scored lower than less accurate perceivers on the personality variable Dominance may mean that persons who are less aggressive, planful, and persistent are better judges of males. This is consistent with the second finding that accurate perceivers of males scored lower than less accurate perceivers on Sociability: that is, they are less enterprising, competitive, and forward. Accurate perceivers of both male and female expressors scored lower on Achievement via Conformance than less accurate perceivers. This falls in line with the personality characteristics above, and all of these findings substantiate the earlier findings of Edwards, Moore, and McWilliams (2). A lower score than less accurate perceivers on Self-Control by accurate perceivers of female expressors seems somewhat contradictory in that this indicates more assertiveness and aggressiveness. However, when one looks at this in terms of the sex of the expressors, it may be meaningful.

The personality variables of accurate perceivers in this study are different from those reported in earlier research by other authors who did not take

into account the sex of the expressors, and who were looking at aspects of person perception different from cognitive perception. This suggests further need for research in the areas of sex-related cognitive perception, personality characteristics, and communication.

REFERENCES

1. EDWARDS, B. C., & MCWILLIAMS, J. M. Perceiver sex and expressor sex as related to cognitive perception. *J. of Psychol.*, 1974, **86**, 203-207.
2. EDWARDS, B. C., MOORE, J. B., & MCWILLIAMS, J. M. Personality variables as related to accuracy of attitude judgment. *Educ. Catalyst: Tenn. J. Prof. Educ.*, 1971, **1**, 47-51.
3. HJELLE, L. A. Personality characteristics associated with interpersonal accuracy. *J. Counsel. Psychol.*, 1969, **16**, 579-581.
4. SHRAUGER, S., & ALTROCCHI, J. The personality of the perceiver as a factor in person perception. *Psychol. Bull.*, 1964, **62**, 289-308.
5. TAFT, R. The ability to judge people. *Psychol. Bull.*, 1955, **52**, 1-23.
6. TAGIURI, R. Person perception. In Lindzey, G., & Aronson, E., *Handbook of Social Psychology* (Vol. 1). Reading, Mass.: Addison-Wesley, 1969. Pp. 395-449.
7. VINGOE, F. J., & ANTONOFF, S. R. Personality characteristics of good judges. *J. Counsel. Psychol.*, 1968, **15**, 91-93.

Department of Educational Psychology
Tennessee Technological University
Cookeville, Tennessee 38501

PERCEPTIONS OF COLLEGE STUDENTS CONCERNING ALTERNATE LIFE STYLES*¹

*Department of Child Care Services, Northeastern Oklahoma A & M College; and
Department of Family Relations and Child Development, Oklahoma State University*

MAXINE EDWARDS AND NICK STINNETT²

SUMMARY

In this study, the Alternate Life Styles Perceptions Scale (ALPS) was developed and administered to a sample of 768 college students representing five regions of the nation. The results indicated that the college students' perceptions toward alternate life styles are more conservative and negative than is often believed. The most favorable perceptions were expressed toward trial marriage, and the least favorable perceptions were expressed toward extramarital sexual relations without the knowledge of one mate. ALPS scores were found to be significantly related to several background factors.

A. INTRODUCTION

Currently, an increasing number of youth are experimenting with alternate life styles, and these nontraditional styles are viewed as viable options by an increasing minority. Whether the trend is enduring is not yet certain, but it seems probable that the trend has not yet peaked (3, 8).

Though sufficient evidence does not now exist concerning the effects of alternate life styles upon the growth and development of individuals or upon social relationships, social scientists are increasingly becoming aware of the important implications which the recent emergence of such life styles may have for society. Sussman and Cogswell (13, p. 381) have noted that the various alternate life styles "already are influencing the structure, interaction patterns, and activities of today's nuclear family and will continue to have such effects in the future."

There is an increasing need to identify the etiological factors that are

* Received in the Editorial Office on March 22, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Gratitude is expressed to Larry and Joan Constantine, Senior Research Associates, Multilateral Relations Study Project, West Acton, Massachusetts, for their helpful evaluation of the research instrument used in this study.

² Reprints are available from the second author at the address shown at the end of this article.

associated with some youths' rejection of traditional family life patterns and acceptance of alternate life styles. In order to achieve this goal, research is needed to examine what the perceptions of youth actually are concerning various alternate life styles and to identify those factors that are closely associated with positive perceptions of alternate life styles. Research of this type, as will as instruments designed to measure such perceptions, is very limited.

The review of the literature indicates that there is very little published research concerning youths' perceptions of various alternate life styles. The available literature indicates the following sometimes contradicting observations:

1. It was estimated that by 1971 there were approximately 3600 communes in the United States (12). Morrone (10) reports that in a poll of 350 single, college women it was found that while the respondents were aware of the advantages and disadvantages of communal living, they tended to favor love and marriage in the traditional marriage setting.

2. In one national study reported in *Psychology Today*, only nine percent of the respondents favored group marriage, while another 16 percent indicated that they might be interested in group marriage (1).

3. In a survey of 86 undergraduate students at Cornell University it was found that 34 percent had participated in some form of cohabitation. Approximately three-fourths of this sample estimated that 40 percent of Cornell undergraduates experienced cohabitation prior to marriage (9).

4. Hunt (5) found that a large majority of the respondents always or usually disapproved of adultery. While those who had experienced extramarital sexual relationships were more tolerant, even the majority of this group were disapproving of extramarital sexual relationships. In a national survey of *Psychology Today* readers it was found that approximately 80 percent condoned extramarital sexual relationships in varying circumstances, while only 40 percent of the married men and 36 percent of the married women had engaged in extramarital sexual relationships (1). Johnson (6) found that 28 percent of his sample reported having experienced extramarital sexual relationships. Johnson also found a much higher proportion of husbands (48%) than wives (5%) indicated a desire to participate in an extramarital sexual experience.

5. It has been estimated that one to two million persons have regularly exchanged partners with the knowledge and consent of their spouses (2, 3). Three percent of the National Institute of Mental Health panel of young married persons supported an ethos which explicitly valued comarital in-

vovement (7). Althenasiou, Shaver, and Tarvis (1) found in their study that only five percent of the married couples reported that they had participated in swinging, while over 30 percent indicated that they might be interested.

The general purposes of the present study were as follows:

1. To devise an instrument (the Alternate Life Styles Perceptions Scale) for measuring perceptions of college youth toward each of seven specific alternate styles, which according to the literature are among the major alternate life styles currently being experienced and discussed. These seven life styles include the following: (a) extramarital sexual relations with mutual consent of husband and wife; (b) extramarital sexual relations without the knowledge of one mate; (c) marriage between homosexual persons; (d) cohabitation; (e) trial marriage; (f) group marriage; and (g) communal living (i. e., a group of unmarried individuals and/or married couples living together sharing a common household or households, many of whom seek close, meaningful interaction within the group and who may share common life philosophies or ideologies and such aspects of living as economic resources, child rearing, and sexual relations).

2. To determine those alternate life styles toward which college students hold the most and least favorable perceptions.

3. To compare perceptions of college youth toward alternate life styles in relation to selected background variables. Specifically, the purposes of this study were to examine the null hypotheses that there is no significant difference in total Alternate Life Styles Scale scores according to each of the following: (a) sex, (b) age, (c) religious preference, (d) degree of religious orientation, (e) type of religious orientation in family background, (f) present type of religious orientation, (g) political orientation, (h) marital status, (i) grade average, (j) marital status of parents, (k) previous exposure to family life education course, (l) geographic region of the United States lived in for major part of life, (m) size of community lived in for major part of life, (n) college or university where respondent is a student.

B. PROCEDURE

1. Subjects

The 768 subjects for this study were undergraduate college students who were enrolled in family relations courses at seven universities, representing five regions of the country. All of the schools represented were selected for their regional location and are major state supported universities. The sample was composed of volunteer students responding anonymously who were attending the seven universities in the following proportions: (a) 7.94% at

the University of Arizona and 13.94% at Oklahoma State University, representing the Southwest region; (b) 7.29% at Oregon State University, representing the Northwest region; (c) 19.27% at Michigan State University, representing the Midwest region; (d) 34.77% at the University of Alabama and 7.55% at Virginia Polytechnic Institute, representing the Southeast region; (e) 9.24% at State University of New York at Plattsburgh, representing the Northeast region. It was felt that because of the nature of the material, greater accuracy in response would be obtained if the subjects responded anonymously.

Of the 768 subjects who participated in this study, 29 percent of the respondents were male, and 71 percent were female. Ages of the respondents ranged from 17-18 years to over 30, with the largest number (45.57%) falling in the 19-20 year category, and the smallest number (1.19%) in the over 30 category.

The majority of the subjects (62.91%) were Protestant. Most of the subjects (70.31%) indicated their degree of religious orientation as religious. The largest percentage of the respondents (44.53%) indicated that the religious orientation of the family in which they were reared was conservative, while the largest proportion (34.33%) indicated that their present religious orientation was liberal.

The greatest proportion of the students reported a middle-of-road (39.08%) or liberal (34.52%) political orientation. Most of them were single, and most indicated an approximate grade average of B. The largest proportion of respondents' parents were living together (83.66%).

Family life education appeared to have been present in only 47.85% of the students' previous educational experience. The largest proportion (40.37%) of students in the sample were reared in the Southern region of the United States and came from cities of over 100,000.

2. *Instrument: The Alternate Life Styles Perceptions Scale (ALPS)*

The questionnaire used in this study consisted of fixed-alternative type questions which were designed to obtain information concerning background characteristics of the subject and perceptions of seven alternate life styles. In order to determine the respondents' perceptions of alternate life styles, the Alternate Life Styles Perceptions Scale (hereafter referred to as the ALPS) was developed.

The ALPS is a 35-item, Likert-type scale which seeks to determine perceptions of each of the seven following alternate life styles: (a) extramarital sexual relations with the mutual consent of both husband and wife; (b)

extramarital sexual relationships without the knowledge of one mate; (c) marriage between homosexual persons; (d) cohabitation; (e) trial marriage; (f) group marriage; and (g) communal living. Items in the ALPS were presented in both positively and negatively worded statements in order to avoid set response. Each of these seven alternate life styles was represented by five items. The 35 items in this scale are characterized by five degrees of response: (a) strongly agree, (b) agree, (c) undecided, (d) disagree, (e) strongly disagree. The answers were scored so that the most favorable response was given the highest score, and the least favorable response was given the lowest score.

As a measure of the validity of the items in the ALPS Scale, they were presented to a panel of seven family life specialists, all of whom hold advanced degrees. Two of the panel members who judged the items are among the nation's leading researchers in alternate life styles. The judges were asked to judge the items in terms of clarity and relevancy (i. e., whether each of the items dealing with a particular aspect of the seven alternate life styles was actually relevant in eliciting perceptions of that particular life style). As a further indication of the validity of the ALPS, an item analysis utilizing the chi square test was made in order to determine those items that significantly differentiated between those subjects scoring in the upper quartile and lower quartile on the basis of each of the subscale scores. All of the 35 items in the ALPS were found to be significantly discriminating at the .001 level. A split-half reliability coefficient (computed with the Spearman-Brown correction formula) of .95 was obtained in determining an index of the reliability of the items in the ALPS.

C. RESULTS

1. *Mean Subscores of ALPS*

The scores for each of the five items representing each life style were obtained by scoring the responses to each item on a continuum of 1 to 5, with 1 representing the least favorable response and 5 representing the most favorable response. The scores were totaled in order to obtain a subscore for each life style. Mean subscores were then obtained in order to determine those experimental life styles toward which students were most and least accepting. As Table 1 shows, the mean subscores indicate that these college students had the most favorable perceptions toward trial marriage and the least favorable perceptions toward extramarital sexual relations without the knowledge of one mate.

TABLE 1
ALTERNATE LIFE STYLES PERCEPTIONS SCALE (ALPS) MEAN SUBSCORES AND
PERCENTAGES OF FAVORABLE RESPONSES BY SUBSCALES AND TO TOTAL ITEMS

Category	Mean subscore	Favorable %	Uncertain %	Unfavorable %
Extramarital sexual relations with mutual consent of husband and wife	10.71	13.63	20.68	65.69
Extramarital sexual relations without the knowledge of one mate	8.76	6.35	10.70	82.42
Marriage between homosexual persons	14.18	33.22	29.09	37.70
Cohabitation	14.07	36.62	19.17	44.17
Two-stage or trial marriage	15.84	44.86	25.88	29.27
Group marriage	10.08	6.43	19.34	74.45
Communal living	14.00	30.28	29.35	40.39
Total ALPS items		24.48	22.03	53.44

2. ALPS Item Responses

As illustrated in Table 1, when the total percentages of favorable-unfavorable responses to the items in the ALPS were analyzed, it was found that only 24.48% of all responses were favorable. The majority of the responses (53.44%) were unfavorable, and 22.03% of the responses were in the category of uncertain.

When the percentages of favorable-unfavorable responses were determined for each subscale, the highest percentage of favorable responses, as shown in Table 1, was in the area of trial marriage (44.86%). The lowest percentages of favorable responses were in the areas of extramarital sexual relations without the knowledge of one mate (6.35%) and group marriage (6.43%).

As Table 2 indicates, the fifth item in each subscale refers to personal preference of the respondent ("This would not be an acceptable life style for me"). When these particular items were analyzed, 65.38% of the responses indicated that the alternate life styles in general were not personally acceptable to them. The responses to these items were often different from the responses to other items. For example, in the trial marriage set of items, 63.67% of the students agreed that this life style might result in fewer divorces, but only 38.80% indicated that this life style would be personally acceptable to them.

One item in each scale was specifically related to children (i. e., the effect that life style would have on children). The group marriage item was excluded from the average of these responses because it was not specifically

TABLE 2
RESPONSES OF COLLEGE STUDENTS TO THE ALTERNATE LIFE
STYLES PERCEPTIONS SCALE ITEMS

Item	Agree		Uncertain		Disagree	
	N	%	N	%	N	%
<i>Extramarital sexual relations with mutual consent</i>						
Is one major factor contributing to divorce	329	42.84	213	27.73	226	29.43
Improves the quality of the marriage relationship	45	5.86	168	21.88	555	72.27
Has a harmful effect on the children of the parents involved	589	76.69	121	15.76	58	7.55
Helps fulfill more of an individual's emotional needs than is possible in exclusively monogamous marriage relationships	112	14.58	175	22.79	481	62.63
Would not be an acceptable life style for me	445	80.08	82	10.68	71	9.25
<i>Extramarital sexual relations without mutual consent</i>						
Is one major factor contributing to divorce	680	88.54	56	7.29	32	4.17
Improves the quality of the marriage relationship	15	1.95	60	7.81	693	90.23
Has a harmful effect on the children of the parents involved	652	84.90	75	9.77	41	5.34
Helps fulfill more of an individual's emotional needs than is possible in exclusive monogamous marriage relationships	102	13.28	163	21.22	503	65.49
Would not be an acceptable life style for me	657	85.55	57	7.42	54	7.04
<i>Marriage between homosexual persons</i>						
Contributes to the emotional health of homosexual persons	311	40.89	296	38.54	161	20.97
Threatens the stability of our existing family system	220	28.65	157	20.44	391	50.91
Helps homosexual persons establish more fulfilling relationships with each other	392	51.04	276	35.95	100	13.02
Causes children reared by homosexual couples to have more emotional problems than children reared by heterosexual couples	468	60.94	259	33.72	41	5.34
Is not a life style I would want to be closely associated with (such as living next to a homosexual couple)	499	64.98	129	16.80	140	18.23
<i>Cohabitation</i>						
Is a good way for two people to test their compatibility before marriage	427	55.59	125	16.28	216	28.12
Results in the couple being less committed to each other than they would be if they were legally married	443	57.68	82	10.68	243	31.64

TABLE 2 (continued)

Item	Agree		Uncertain		Disagree	
	N	%	N	%	N	%
Offers more advantages than disadvantages to a couple	224	29.20	237	30.90	306	39.90
Results in children born to such couples having more problems than children of legally married couples	464	60.42	153	19.92	151	19.66
Would be an acceptable life style for me	362	47.13	139	18.10	267	34.77
<i>Trial marriage</i>						
Would result in fewer divorces	489	63.67	170	22.14	109	14.19
Would result in decreased commitment within the marriage relationship	281	36.59	175	22.79	312	40.63
Would result in more satisfying marriage relationships	382	49.74	237	30.86	149	19.41
Would provide a more positive emotional climate for rearing children than does traditional marriage	242	31.51	256	33.33	270	35.15
Would be an acceptable life style for me	298	38.80	156	20.31	314	40.89
<i>Group marriage</i>						
Involves too much conflict to be satisfying	625	81.39	106	13.80	37	4.52
Improves our family system	27	3.52	133	17.32	608	79.16
Contributes to an increased ability to establish loving, intimate relationships	77	10.03	159	20.70	532	69.27
Helps to decrease the divorce rate	73	9.50	274	35.68	421	54.82
Is not an acceptable life style for me	673	87.63	61	7.94	34	4.42
<i>Communal living</i>						
Offers great possibilities for personal growth and development	300	39.06	224	29.17	244	31.77
Contributes to the instability of society	249	32.42	229	29.82	290	37.76
Contributes positively to children's emotional health	153	19.93	266	34.64	349	45.44
Promotes fulfilling, close human relationships	296	38.55	254	33.07	218	28.38
Would not be an acceptable life style for me	490	63.80	154	20.05	124	16.15

worded to include children. The majority of the students' perceptions (60.59%) concerning the effect of the alternate life styles on children were unfavorable.

Table 2 reveals the percentage of agree, uncertain, and disagree responses to each of the 35 items in the ALPS. In this table, for purposes of simplification, the categories of strongly agree and agree were combined into one category referred to as "agree," while categories of disagree and strongly disagree were combined into one category referred to as "disagree."

3. *Student Perceptions of Traditional Marriage*

In addition to obtaining the students' perceptions of alternate life styles, it also seemed desirable to obtain their perceptions of traditional marriage. When the students were asked to respond to the question "Do you believe that traditional monogamous marriage is the most fulfilling type of man-woman relationship?" 538 (70%) answered *yes*, 172 (22%) were *undecided*, and only 56 (8%) answered *no*. These findings coincide with the report of Morrone (10) and strongly reflect the Judeo-Christian emphasis on traditional marriage, home, and family which has been a part of the cultural heritage of the United States, indicating that the pendulum of change has not gone as far beyond the traditional conservative perceptions of marriage as is often suggested by the mass media.

4. *Examination of Hypotheses*

The one-way classification analysis of variance was utilized to examine the null hypotheses. A detailed description of the variables that were found to be significantly related to total ALPS scores is shown in Table 3. The results indicated that there were significant differences in total ALPS scores according to the following variables:

(a) *Sex* (at the .001 level), with males receiving a higher mean ALPS score than females, reflecting more favorable perceptions of alternate life styles.

(b) *Religious preference* (at the .001 level), with students who indicated no religious preference expressing the most favorable perceptions of alternate life styles, while those with a Protestant preference indicated the least positive perceptions.

(c) *Degree of religious orientation* (at the .001 level), with nonreligious students indicating the most favorable perceptions of alternate life styles, and those who reported their orientation as very religious expressing the least positive perceptions.

(d) *Type of religious orientation in family background* (at the .001 level) with those who indicated no religious orientation in their family background reflecting the most favorable perceptions of alternate life styles, while those who indicated that their families had been conservative in religious orientation showed the least favorable perceptions of these life styles.

(e) *Respondent's present type of religious orientation* (at the .001 level) with the most favorable perceptions of alternate life styles indicated by students who professed no present religious orientation, while the least favor

able perceptions were expressed by students who considered themselves to be orthodox/fundamentalist in their present religious orientation.

(f) *Political orientation* (at the .001 level), with those students who reported that their political orientation was *revolutionary* indicating the most favorable perceptions of alternate life styles, while those students who indicated a very conservative political orientation expressed the least favorable perceptions.

(g) *Marital status* (at the .05 level), with married students indicating the most favorable perceptions of alternate life styles, and divorced or widowed students reflecting the least favorable perceptions.

(h) *Previous exposure to a family life education course* (at the .01 level), with those students who reported having had previous exposure to a family life education source expressing significantly less favorable perceptions of alternate life styles than did those who indicated no previous exposure to a family life education course.

(i) *Geographic region lived in for major part of life* (.001 level), with the most favorable perceptions of alternate life styles indicated by students from the Midwestern region of the United States (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin), while the least favorable perceptions were reported by students who had lived most of their lives in New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont).

(j) *Size of community lived in for major part of life* (at the .01 level), with students who reported living in communities of over 100,000 population for the major part of their lives expressing the most favorable perceptions of alternate life styles, while students who indicated living on farms or in the country for the major part of their lives reflected the least favorable perceptions of alternate life styles. However, it is interesting to note that there was not a perfect, positive relationship between size of community and favorable perceptions of alternate life styles.

(k) *College or university where respondent is a student* (at the .001 level), with students from Michigan State University reflecting the most favorable perceptions of alternate life styles, while students from Oklahoma State University expressed the least favorable perceptions.

The following variables were not found to be significantly related to total ALPS scores: age, grade average, and marital status of parents. Further analysis was conducted examining the relationship between the same variables just discussed and each of the seven ALPS subscores. However, because of limited space these findings are not reported here, as the same general pattern

TABLE 3
F SCORES REFLECTING DIFFERENCES IN TOTAL ALTERNATE
LIFE STYLES PERCEPTIONS SCALE SCORES

Variable	N	\bar{X}	F
<i>Sex</i>			
Male	225	93.34	33.59***
Female	541	83.91	
<i>Religious preference</i>			
Catholic	133	87.06	22.75***
Protestant	479	82.80	
Jewish	20	93.50	
None	85	104.88	
Other	41	86.61	
<i>Degree of religious orientation</i>			
Very religious	56	71.37	46.53***
Religious	540	83.62	
Nonreligious	158	101.28	
Antireligious	14	96.07	
<i>Type of religious orientation in family background</i>			
Orthodox/fundamentalist	36	87.22	5.57***
Conservative	242	83.16	
Middle-of-road	292	88.94	
Liberal	82	89.35	
None	16	101.31	
<i>Present type of religious orientation</i>			
Orthodox/fundamentalist	21	74.00	56.52***
Conservative	155	74.15	
Middle-of-road	243	81.30	
Liberal	262	93.34	
None	85	106.09	
<i>Political orientation</i>			
Very conservative	8	72.12	38.92***
Conservative	165	74.41	
Middle-of-road	299	83.43	
Liberal	265	95.30	
Radical	18	109.50	
Revolutionary	10	120.20	
<i>Marital status</i>			
Single	661	85.82	4.06*
Married	100	91.71	
Divorced or widowed	5	76.00	
<i>Previous exposure to a family life education course</i>			
Yes	367	84.39	8.56**
No	399	88.80	
<i>Geographic region</i>			
Middle Atlantic states	90	87.44	7.25***
Midwestern states	155	94.89	
New England	5	82.60	
Pacific Coast states	67	90.82	
Rocky Mountain states	6	87.17	
Southern states	306	82.63	
Southwestern states	129	82.99	
<i>Size community</i>			
On farm or in country	103	82.20	

TABLE 3 (continued)

Variable	<i>N</i>	\bar{X}	<i>F</i>
Small town under 25,000	190	84.83	4.50**
25,000-50,000 population	139	88.76	
50,000-100,000 population	128	83.72	
Cities over 100,000	207	90.79	
<i>College or university</i>			
University of Arizona	61	90.97	11.41***
Oklahoma State University	107	79.92	
Oregon State University	56	88.91	
Michigan State University	147	96.35	
University of Alabama	267	81.41	
Virginia Polytechnic Institute	58	90.69	
State University of New York at Plattsburgh	71	86.86	

Note: The numbers do not always add up to 768 because some of the questions were not answered by all 768 students.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

of significant relationships was found for the subscores as was reported for the total ALPS scores.

D. DISCUSSION

The results suggest the general conclusion that college students are more conservative in their perceptions toward the alternate life styles considered in this study than is popularly assumed. This was indicated by (a) the finding that the majority of respondents (65.38%) reported that the various life styles considered were personally not acceptable to them, (b) the finding that fewer than 25 percent of the students' total ALPS responses were favorable toward all alternate life styles considered in this study, and (c) the finding that the majority (70%) believed that traditional monogamous marriage is the most fulfilling type of man-woman relationship.

While 70% of the respondents felt that traditional marriage was the most fulfilling type of man-woman relationship, a marked proportion (22%) of the students indicated that they were uncertain concerning whether monogamous marriage is the most fulfilling type of man-woman relationship.

The finding that the most favorable mean subscore and the highest percentage of favorable responses were in the area of trial marriage is interesting in that the students expressed the most favorable perceptions toward the alternate life style (trial marriage) which is most closely associated with traditional monogamous marriage.

The finding that the great majority of responses to the two subscales con-

cerning extramarital sexual relationships were unfavorable coincides with the finding of Hunt (5) that the majority of his respondents always or usually disapproved of adultery.

The findings that men expressed significantly more favorable perceptions toward alternate life styles than did women may be explained by research findings that indicate that men have less favorable perceptions of marriage than do women (14), and by the fact that the benefits and satisfactions of marriage are emphasized in the process of socialization for women more than for men (15, 16). This finding may also reflect the cultural expectation that men are more liberal in their views of sexual behavior and interpersonal relationships in general.

The finding that the most favorable perceptions toward alternate life styles were expressed by students with no religious orientation or antireligious orientation and by students with a revolutionary or radical political orientation may reflect the fact that these students generally feel alienated from the mainstream of society and tend to reject much of what they consider to be the "establishment." It is perhaps logical that such individuals would have more favorable perceptions toward life styles considered to be non-conventional than would individuals who have identified with the "establishment" or mainstream of society.

The finding that students who lived on farms or in the country for the major part of their lives indicated the least favorable perceptions of alternate life styles reflects the more conservative and traditional pattern of child rearing commonly associated with rural family life styles. This finding would also seem to be due to a greater degree of social group control in small rural communities in which participation in alternate life styles would be censored more, contributing to less favorable perceptions of such life styles.

The finding that those students who reported having previous exposure to a family life education course reflected significantly more negative perceptions toward alternate life styles appears to be related to the results of Walters, Parker, and Stinnett (14) indicating that those students who reported previous exposure to a family relations course expressed the most favorable perceptions toward traditional marriage. The present finding is also related to other research indicating that unmarried students' attitudes toward marriage and family living shift positively as the result of a family relations course (4, 11). It seems logical that the more positive the perceptions toward traditional marriage the less positive would be the perceptions toward alternate life styles.

In interpreting the results of this study, as with any study, the limitations

of the sample should be noted. For example, the majority of the sample was composed of females, and all of the respondents were enrolled in a family relations course.

It is suggested that future research might profitably examine the relationship of various personality characteristics to perceptions of alternate life styles. Such research could increase knowledge concerning the personality qualities that distinguish those who have the most favorable and the least favorable perceptions toward alternate life styles.

REFERENCES

1. ATHENASIOU, R., SHAVER, P., & TARVIS, C. Sex. *Psychol. Today*, 1970, 4, 39-52.
2. BARTELL, D. Group Sex: A Scientist's Eye-witness Report of the American Way of Swinging. New York: Wyder, 1971.
3. CONSTANTINE, L., CONSTANTINE, J., & EDELMAN, K. Counseling implications of comarital and multilateral relations. *Fam. Coordinator*, 1972, 21, 267-273.
4. DUVAL, E. How effective are marriage courses? *J. Mar. & Fam.*, 1965, 27, 176-184.
5. HUNT, M. The Affair. New York: World, 1969.
6. JOHNSON, R. E. Some correlates of extramarital coitus. *J. Mar. & Fam.*, 1970, 32, 449-456.
7. KALKA, J. S., RYDER, R. G., & OLSON, D. H. A nonconventional pattern within the conventional marriage framework. Unpublished research report, National Institute of Mental Health, Bethesda, Maryland, 1969.
8. LYNESS, J., LIPETZ, M. E., & DAVIS, K. E. Living together: An alternative to marriage. *J. Mar. & Fam.*, 1972, 34, 305-311.
9. MACKLIN, E. D. Heterosexual cohabitation among unmarried college students. *Fam. Coordinator*, 1972, 21, 462-472.
10. MORRONE, W. W. Facts and fictions singles have about love and marriage. *Glamour*, 1971, February, 126-127.
11. OLSON, D. H., & GRAVATT, A. Attitude change in a functional marriage course. *Fam. Coordinator*, 1968, 17, 99-104.
12. OTTO, H. A. Communes: The alternative life style. *Sat. Rev.*, 1971, 65, 16-21.
13. SUSSMAN, M. B., & COGSWELL, E. The meaning of variant and experimental marriage style and family forms in the 1970's. *Fam. Coordinator*, 1972, 21, 375-381.
14. WALTERS, J., PARKER, K., & STINNETT, N. College students' perceptions concerning marriage. *Fam. Perspective*, 1972, 7, 43-49.
15. WHITE, L. The changing context of women's education. *Mar. & Fam. Living*, 1955, 17, 291-295.
16. WILLIAMSON, R. Dating courtship and the "ideal mate": Some relevant subcultural variables. *Fam. Life Coordinator*, 1965, 14, 137-143.

Department of Family Relations and Child Development
Oklahoma State University
Stillwater, Oklahoma 74074

ABBREVIATIONS OF WORDS USED IN THE TITLES OF JOURNALS

(One-word titles are never abbreviated. The word "the" is not used, nor its equivalent in any other language. The word "of" or its equivalent in other languages is used only to discriminate what would otherwise be identical titles in different languages. The word "and" is always used, but indicated by "&" in the Roman alphabet. Only English words are indicated here, but the corresponding words in other languages should receive a corresponding abbreviation. All abbreviations and all one-word titles should be in italics.)

Abnormal	<i>Abn.</i>	Japanese	<i>Jap.</i>
Abstracts	<i>Abst.</i>	Journal	<i>J.</i>
American	<i>Amer.</i>	Mathematical	<i>Math.</i>
Anatomy	<i>Anat.</i>	Measurement	<i>Meas.</i>
Animal	<i>Anim.</i>	Medical	<i>Med.</i>
Applied	<i>Appl.</i>	Mental	<i>Ment.</i>
Archives	<i>Arch.</i>	Monographs	<i>Monog.</i>
Association	<i>Assoc.</i>	Neurology	<i>Neurol.</i>
Attitude	<i>Attit.</i>	Opinion	<i>Opin.</i>
Australian	<i>Aust.</i>	Orthopsychiatry	<i>Orthopsychiat.</i>
Behavior	<i>Behav.</i>	Personality	<i>Personal.</i>
British	<i>Brit.</i>	Personnel	<i>Person.</i>
Bulletin	<i>Bull.</i>	Philosophy	<i>Philos.</i>
Bureau	<i>Bur.</i>	Physics	<i>Phys.</i>
Canadian	<i>Can.</i>	Physiology	<i>Physiol.</i>
Character	<i>Charac.</i>	Proceedings	<i>Proc.</i>
Children	<i>Child.</i>	Psychiatry	<i>Psychiat.</i>
Chinese	<i>Chin.</i>	Psychoanalysis	<i>Psychoanal.</i>
Clinical	<i>Clin.</i>	Psychology	<i>Psychol.</i>
College	<i>Coll.</i>	Psychosomatic	<i>Psychosomat.</i>
Comparative	<i>Comp.</i>	Quarterly	<i>Quart.</i>
Consulting	<i>Consult.</i>	Religious	<i>Relig.</i>
Contributions	<i>Contrib.</i>	Research	<i>Res.</i>
Development	<i>Devel.</i>	Review	<i>Rev.</i>
Educational	<i>Educ.</i>	School	<i>Sch.</i>
Experimental	<i>Exper.</i>	Science	<i>Sci.</i>
General	<i>Gen.</i>	Social	<i>Soc.</i>
Genetic	<i>Genet.</i>	Statistics	<i>Stat.</i>
Indian	<i>Ind.</i>	Studies	<i>Stud.</i>
Industrial	<i>Indus.</i>	Teacher	<i>Teach.</i>
International	<i>Internat.</i>	University	<i>Univ.</i>
Italian	<i>Ital.</i>		

Preparation of Manuscripts for The Journal Press

GENERAL INSTRUCTIONS

1. The proper sequence for the parts of your submitted manuscript is as follows: (a) text, (b) references, (c) footnotes, (d) tables, (e) figures, and (f) figure legends. However, monographs start with a table of contents and may have an acknowledgment page before the text and an appendix immediately after the text.
2. Use heavy typewriter paper, $8\frac{1}{2} \times 11$ inches, double-space *all* lines, and leave margins editorial work. Do not use onionskin, odd sizes, and abrasive or wax finishes.
3. Submit original typewritten version and one copy. Retain second copy for proofing.
4. Retype any page on which written corrections have been made.
5. Do not begin a sentence with a numeral.
6. A summary at the beginning of the text is required for articles over 500 words.
7. Each quotation should indicate the page number of the original source. The original publisher must give permission for lengthy quotations and use of tables or figures.
8. Do not fold your manuscript.
9. Enclose a submission letter, with a statement that the manuscript is not under consideration elsewhere. If you are unknown to the Editors, kindly give your credentials.

FORMAT AND SPECIFIC INSTRUCTIONS

A. TEXT DIVISIONS

I. THE TITLES OF JOURNAL ARTICLES AND THE MAJOR SUBDIVISIONS OF MONOGRAPHS ARE PRINTED IN TEN-POINT CAPS CENTERED ON THE PAGE

- THE NEXT SUBDIVISION TITLE IS PRINTED IN CAPS AND SMALL CAPS CENTERED ON THE PAGE
1. *Then Italics, with Principal Words, Upper and Lower Case, Centered on the Page.*
 2. *Then italics, upper and lower case, 1-em run-in side head.*
 3. *(1). Then italics, upper and lower case, 2-em run-in side head.*
 4. *(a). Then italics, upper and lower case, 3-em run-in side head.*
- Further subdivision should be merged into the text without marginal indentation, and should be numbered with small letters.]

B. REFERENCES

- References should be arranged in alphabetical order by author, numbered and referred to in the text by number (2). Double-space!
- The proper form of a book reference is as follows:
DOE, J. The Preparation of Manuscripts. New York: Holt, 1963. Pp. 400-418.
- The proper form of a journal reference is as follows:
DOE, J. The preparation of manuscripts. *J. Gen. Psychol.*, 1963, 68, 450-462.
- In the text it is desirable to refer to a page, thus (2, p. 45).

C. FOOTNOTES

- Use as few as possible and number consecutively in the text thus,¹
- Footnote (on the separate footnote page). Double-space!

D. TABLES

- Each table should be typed on a separate sheet and should be Arabic numbered (Table 2). Each column requires a heading. Vertical lines should be avoided. Mention tables consecutively in the text and indicate approximate insertion points.

E. FIGURES

- Figures should be submitted as glossy prints of the approximate size for final reproduction (usually $4\frac{1}{2}$ inches in width). Lettering and lines should be sharp and clean. Figures should be Arabic numbered (Figure 2) in the text, and have consecutive mention and approximate insertion points. Each figure requires a legend, but all legends should be submitted double-spaced on a separate Figure Legends page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

July, 1974
Volume 87, Second Half

Founded in 1935 by Carl Murchison

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

IRVIN L. CHILD
Yale University

LEONARD W. DOOB
Yale University

CHARLES K. FERGUSON
University of California,
Los Angeles

FRANK R. GELDARD
Princeton University

GEORGE M. GUTHRIE
Pennsylvania State
University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

If this space be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special

edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

DAVID HOTHERSALL
Ohio State University

DARWIN P. HUNT
New Mexico State
University

J. McV. HUNT
University of Illinois

JEROME KAGAN
Harvard University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

ARTHUR J. RIOPELLE
Louisiana State University

WARREN H. TEICHER
New Mexico State
University

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass.
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02657

Microfiche Now Available

Back Issues

While continuing to maintain a complete inventory of paper-bound back issues for all five journals—some reprinted and some original editions—The Journal Press is now offering microfiche (negative silverfiche) versions for all but the last two calendar years: i.e., Volume 1 through 1970 volumes are available immediately; 1971 volumes will first be available in January 1974; 1972 volumes, in January 1975, etc. The minimum order is for one volume. The following rates are in effect: Paper-bound—single numbers, \$9.00; microfiche, not available. Paper-bound—two-part volumes, \$18.00; microfiche, \$6.00. Paper-bound—three-part volumes, \$27.00; microfiche, \$9.00. Paper-bound—four-part and over-four-part volumes, \$36.00; microfiche, \$12.00. The only exceptions (special issues) are starred below.*

VOLUMES	DATES	PRICE PER VOLUME		PRICE THROUGH 1970	
		PAPER	MICRO-FICHE	PAPER	MICRO-FICHE
<i>Journal of Genetic Psychology</i> (Pedagogical Seminary)					
1-117	1891-1970				
1-4	1891-April 1897	\$27.00	\$ 9.00	\$2754.00	\$895.00
5-37	July 1897-1930	36.00	12.00		
38*	1930	18.00	6.00		
39	1931	36.00	12.00		
40 and later	1932-	18.00	6.00		
<i>Genetic Psychology Monographs</i>					
1-82	1926-1970			1872.00	620.00
1-22	1926-1940	36.00	12.00		
23 and later	1941-	18.00	6.00		
<i>Journal of General Psychology</i>					
1-83	1928-1970			1566.00	520.00
1-3	1928-1930	36.00	12.00		
4*	1930	18.00	6.00		
5	1931	36.00	12.00		
6 and later	1932-	18.00	6.00		
<i>Journal of Social Psychology</i>					
1-82	1930-1970			1656.00	550.00
1-10	1930-1939	36.00	12.00		
11 and later	1940-	18.00	6.00		
<i>Journal of Psychology</i>					
1-76	1935/36-1970			1368.00	450.00
1 and later	1935/36-	18.00	6.00		

A mailing charge of \$0.30 per volume is made for foreign delivery of paper editions. Domestic paper mailings carry no postage charge. Prepaid foreign and domestic microfiche orders are also postage free; other orders will be billed for costs. Remittances should be by check or money order payable in U.S. funds on a United States bank, with no bank commission deducted. Advance payment is required from all individuals and from foreign purchasers. Microfilm versions and special bindings are not available. Microfiche orders only may be sent directly to The Journal Press or to Johnson Associates Inc., 175 Fifth Avenue, New York, New York 10010.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Notice: All copyrighted material reprinted or otherwise reproduced from Journal Press publications should be given an appropriate acknowledgment. No permission is necessary for brief quotations and originally worded abstracts (less than 300-word total or 10 percent of length, whichever is least, for any one article). Written permission is required for reprinting or copying tables, figures, summaries, entire articles, or substantial portions thereof; such permission normally carries a charge of \$5 per page and is contingent upon agreement and possible stipulation of the original author or authors. Estate permission can be required. Authors requesting use of their own material are not charged. Fees may be waived for limited-copy instructional usage and for government periodicals. Special rates can be applied when justified.

The Journal of Psychology

Founded in 1935 by Carl Murchison

The Journal of Psychology was founded at the request of many psychologists throughout the world for the purpose of establishing a medium in which publication shall be immediate and in which other publication experiments may be carried out.

(1). The subscription price is \$39.00 per annum, \$18.00 per volume, \$9.00 per issue (three volumes per year).

(2). Manuscripts may be sent to any member of the Editorial Board or may be sent directly to The Journal Press. The lag in publication should not be more than a few weeks.

(3). The author will receive 200 reprints of his paper, and subscribers will receive the accumulated publications bound into half-volume units. The second half of each volume will contain the title page and table of contents for that volume. Each half-volume unit will be mailed to the subscribers at its stated date.

(4). Each author will be charged the manufacturing costs of any zincs, halftone cuts, tables, or equations. Excessive use of special fonts (references, footnotes, quotations, appendices) will also be charged.

(5). The publication charges are as follows:

1 to 4 pages	\$60.00
5 to 8 "	120.00
9 to 12 "	180.00
13 to 16 "	240.00
17 to 20 "	300.00
21 to 24 "	360.00
25 to 28 "	420.00
29 to 32 "	480.00

These charges are subject to adjustment as justified.

(6). The accumulated units will be mailed to subscribers bimonthly: January, March, May, July, September, and November. The units may vary in size to accommodate publication needs.

All back issues are available. See announcement on inside front cover.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Diary
823
18.4

Journal of Genetic Psychology

Founded by G. Stanley Hall in 1891; reorganized by Carl Murchison in 1925

Quarterly, beginning with March. Devoted to developmental and clinical psychology, with briefly reported Replications and Refinements and occasional book reviews. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of General Psychology

Founded in 1927 by E. B. Titchener and Carl Murchison

Quarterly, beginning with January. Devoted to experimental, physiological, and comparative psychology, with briefly reported Replications, Refinements, and Comments. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of Social Psychology

Founded in 1929 by John Dewey and Carl Murchison

Bimonthly, beginning with February. Devoted to studies of persons in group settings and of culture and personality; special attention to cross-cultural articles and notes, to field research, and to briefly reported Replications and Refinements. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Three volumes annually. Per annum, \$39.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Each author will receive 100 unbound reprints gratis. Additional reprints may be purchased at a nominal cost when the author returns page-proof.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Club Rate for Five International Psychological Journals

	PER ANNUM
THE JOURNAL OF GENETIC PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
GENETIC PSYCHOLOGY MONOGRAPHS (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF GENERAL PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF SOCIAL PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
THE JOURNAL OF PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
TOTAL	\$156.00

TEACHERS AND STUDENTS EDITION, *Restricted Sale* \$50.00

The *Teachers and Students Edition* is open to any individual psychologist, teacher, student, or physician but requires an agreement that the edition will not be offered for sale till after five years from publication and an agreement that the edition will not be substituted for an institutional subscription. Write for our Teachers and Students contract card.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Genetic Psychology Monographs

Founded in 1925 by Carl Murchison

Quarterly, beginning with February. Devoted to developmental and clinical psychology. Each number one or more complete researches. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

NOTICE. Effective immediately we offer prior publication for certain selected monographs. Charges will be based on the announced rates for *The Journal of Psychology*. Regular monographs will carry no page charge for the first 50 pages, but for all pages above 50 there will be a charge of \$10.00 per page. Manufacturing costs of any zincs, halftone cuts, tables, or equations will be charged to authors, as will excessive use of special fonts. Two hundred reprints of each monograph will be supplied free of charge.

The listing of monographs for 1926 through 1963 will be printed in the first half of each volume of all five journals. Monographs published after 1963 will be listed in the second half of each volume.

Genetic Psychology Monographs (continued)

VOLUME 69—January-June, 1964

- Occupational and industrial therapy in the treatment of psychiatric patients: A controlled study of efficacy in an intensive-treatment institution—M. HUNDZIAK AND B. PASAMANICK
An analysis of Carl R. Rogers' theory of personality—M. S. KRAUSE
Personality aspects of teaching: A predictive study—H. ZIMLES, B. BIBER, W. RABINOWITZ, AND L. HAY
Situational and personal antecedents of incipient alienation: An exploratory study—W. H. JARRETT AND A. O. HALL
- Age changes in children's Mosaic responses from five to ten years—L. B. AMES AND F. L. ILG
A study of the interview process: The caseworker-client relationship—H. J. MEYER, E. F. BORCATT, AND D. FANSHILL
A study of introversion-extroversion as a personality dimension—R. M. ALLEN, H. M. RICHER, AND R. J. PLOTNIK
Psychological testing with Northwest Coast Alaskan Eskimos—C. E. PRESTON
A study in family pathology—M. B. HANS

VOLUME 70—July-December, 1964

- Structure and function—H. GUTMAN
The Lowenfeld Mosaic Test: Norms for five-to-ten-year-old American public-school children and comparative study of three groups—L. B. AMES, F. L. ILG, AND J. AUGUST
Social and personality correlates of children's estimates of height—J. P. SHAFFER
The development of ethnic attitudes in New Zealand school children—G. M. VAUGHAN
- The antecedents of two varieties of vocational interests—L. E. TYLER
Personality in old age—P. E. SLATER AND H. A. SCARR
Variables affecting experimenter bias in a group situation—R. ROSENTHAL, C. J. FRIEDMAN, C. A. JOHNSON, K. F. T. SCHILL, R. C. WHITE, AND L. L. VIKAN
Ordinal position and sex role identification—B. G. ROSENBERG AND B. SUTTON-SMITH
Personality correlates of accuracy of self-appraisal in four-year-old children—PAUL S. WEINER

VOLUME 71—January-June, 1965

- Author index for Genetic Psychology Monographs 1926-1964—L. W. FERGUSON
A theoretical, developmental, and clinical investigation of embarrassment—J. M. SATTLER
School readiness as evaluated by Gesell developmental, visual, and projective tests—F. L. ILG, L. B. AMES, AND R. APELL
Rorschach scales of regression in psychosis—S. NEIGER, A. G. SLEMON, AND D. A. QUIRK
The effects of extra tactile stimulation on a group of institutionalized infants—L. CASLER
Human-eyelid conditioning: The recent experimental literature—L. E. ROSS AND T. F. HARTMAN
- Social status and schoolroom aggression in third-grade children—R. TOICO
Overt and covert homosexual problems among male college students—L. J. BRAATEN AND C. D. DARLING
Role conceptions of the psychiatric aid—M. P. LAWTON AND A. E. GOLDMAN
Changes in study of values scores during the four years of college—C. W. HUNTLEY

VOLUME 72—July-December, 1965

- A study of process and method in three-year-old twins and triplets learning to read—W. FOWLER
Individualized teaching with therapeutic aims: A methodological study—M. KOHN AND M. RUDNICK
Ability and social adjustment at midlife of persons earlier judged mentally deficient—E. L. MILLER
- Development of incentive values in childhood—S. L. WITRYLO, D. J. TYRRELL, AND L. M. LOWDEN
Longitudinal changes in intolerance and authoritarianism for subjects differing in amount of college education over four years—W. T. PLANT
An NDEA counseling and guidance institute: Prediction, performance, and follow-up—R. H. DANA
The influence of language on classification: A theoretical model applied to normal, retarded, and deaf children—H. G. FURTH AND N. A. MILGRAM
Time estimates as affected by incentive class and motivational level—M. FELIX
Clinical psychology: An historical survey—V. S. SEXTON

VOLUME 73—January-June, 1966

- Vulnerability in infants and young children: A pilot study—G. HEIDER
- Racial preference and ego-identity among white and Bantu children in the Republic of South Africa—A. J. GREGOR AND D. A. MCPHERSON
Mother-child interaction in cerebral palsy: Environmental and psychosocial obstacles to cognitive development—E. SHERE AND R. KASTENBAUM
Children's stories—L. B. AMES

VOLUME 74—July-December, 1966

- Changes in personality for groups completing different amounts of college over two years—W. T. PLANT AND C. W. TELFORD
Brain dynamism in perception of reversible figures—G. K. YACORZYNSKI
Changes in Rorschach response throughout the human life span—L. B. AMES
Mnemonic virtuosity: A study of chess players—A. BINET (Translated by M. L. SIMMEL AND S. B. BARRON)
- The development of behavior patterns in children—B. B. TYLER, F. B. TYLER AND J. E. RAFFERTY
Correlates of classroom functioning—L. M. SMITH AND B. B. HUDGINS
Children's behavior syndromes and parental responses—R. L. JENKINS, E. NUREDDIN, AND I. SHAPIRO

VOLUME 75—January-June, 1967

- Studies of an elementary game of strategy—B. SUTTON-SMITH AND J. M. ROBERTS
Child care practices antecedent three patterns of preschool behavior—D. BAUMRIND
The impact of cognitive maturity on the development of sex-role attitudes in the years 4 to 8—L. KOHLBERG AND E. ZIGLER
- Differential factor structures in mathematical ability—P. S. VERY
Perception of the vertical as a function of affective stimuli and extraneous stimulation in schizophrenic and normal subjects—J. O. WELLS AND W. E. CALDWELL
Mid-life attainment of the mentally retarded: A longitudinal study—W. R. BALLER, D. C. CHARLES, AND E. L. MILLER

VOLUME 76—July-December, 1967

- Mental Development—R. KOHEN-RAZ
The leader and the lost: A case study of indigenous leadership in a poverty program community action committee—L. A. ZURCHER
A developmental study of the perception of people—R. N. WOLMAN
Human fears: A factor analytic study of three age levels—G. W. RUSSELL
- Correlates of voluntary social participation—J. E. TEELE
Personality characteristics and developmental history of creative college women—R. HELSON
A systematic study of therapeutic interventions in nursing homes—B. A. STOTSKY

VOLUME 77—January-June, 1968

- The fulfillment of promise: 40-year follow-up of the Terman Gifted Group—M. H. ODEN
A scale for parents' ratings: Some ipsative and normative correlations—R. N. WALKER
A methodological investigation of Piaget's concept of conservation of substance—A. C. BITTNER AND M. M. SHINEDLING
- Sex differences in mental and behavioral traits—J. E. GARAI AND A. SCHEINFELD

Genetic Psychology Monographs (continued)

VOLUME 78—July-December, 1968

1. A theoretical and developmental investigation of delayed speech feedback—J. E. WATERS
2. Growth changes in factorial structure by age and sex—N. W. DYE AND P. S. VERY
3. A multispect investigation of masculine development in kindergarten age boys—H. B. BILLER
4. The optimum limits of testing on the Wechsler Intelligence Scales—M. Y. QURESHI
5. A developmental study of the ego-ideal—L. VAN DEN DAEL
6. The relationship between physical condition immediately after birth and mental and motor performance at age four—N. EDWARDS

VOLUME 79—January-June, 1969

1. Adolescents: From the views of the members of an informal adolescent group—T. P. JOSEPH
2. Acculturation and childhood accidents among Chinese and Japanese Americans—M. KUROKAWA
3. Dimensions of achievement-related behavior among lower-class Negro parents—D. SOLOMON, R. J. PARELIUS, AND T. V. BUSSE
4. Dimensions in the judgment of illness—J. S. KERRICK
5. Reversal shifts and problem-solving abilities at ages 4-7—S. B. KASTNER
6. The judgment of body landmark heights—H. NASH
7. Recognition of body surface regions—H. NASH

VOLUME 80—July-December, 1969

1. Animal aggression: Review of research—W. M. VERNON
2. The effects of positive and negative reinforcement and test anxiety on the reading performance of male elementary school children—S. COTLER
3. Personality and psychosomatic illness: A selective review of research—P. R. ROBBINS
4. Task and motivational influences on the assessment of creative and intellectual ability in children—N. KOGAN AND F. T. MORGAN
5. A study of an interview method for identifying family authority patterns—R. W. CHAMBERLIN
6. Conditioned reinforcing and aversive aspects of the stimuli defining the components of a two-component chain—A. KAUFMAN AND A. BARON
7. The Henry Hittleson Center Family Interaction Scales—M. L. BEHRENS, D. I. MEYERS, W. GOLDFARB, N. GOLDFARB, AND N. D. FIELDSTEEL

VOLUME 81—January-June, 1970

1. Attitudes of college students and their changes: A 37-year study—V. JONES
2. Tattooing among male and female offenders of different ages in different types of institutions—A. J. W. TAYLOR
3. Sex differences in mental health—J. E. GARAI
4. A selective review of dominance-subordination relations in animals—D. VAN KREVELD
5. The effects of visual or auditory stimulation given in infancy upon subsequent preference for stimulation of both modalities—W. R. BERKOWITZ
6. The influence of certain child-rearing factors upon the development of a structured and salient sense of time—D. ZERN

VOLUME 82—July-December, 1970

1. Child care attitudes and emotional disturbance among mothers of young children—B. J. COHLER, J. L. WEISS, AND H. U. GRUNBAUM
2. A study of intragroup and intergroup relations among experimentally produced small groups—L. N. DIAB
3. The development of role knowledge—D. R. HEISE AND E. P. M. ROBERTS
4. Middleclass: Age related stress periods during adult years—J. E. HORROCKS AND M. C. MUSSMAN
5. The first six years of life: A report of current research and educational practice—E. LACROSSE, P. C. LEE (ED.), F. LITMAN, D. M. OGILVIE, S. S. STODOLSKY, AND B. L. WHITE

VOLUME 83—January-June, 1971

1. Measurement of parents' perceptions of their children's development—W. WOLFENBERGER AND R. A. KURTZ
2. The concomitant development of cognitive and moral modes of thought: A test of selected deductions from Piaget's theory—L. C. LEE
3. Children's influences upon parental behavior: An attempt to define the relationship with the use of laboratory tasks—J. D. OSOFSKY
4. Parent behavior and child academic achievement, achievement striving, and related personality characteristics—D. SOLOMON, K. A. HOULIHAN, T. V. BUSSE, AND R. J. PARELIUS
5. Memory factors and school success of average and special groups of ninth-grade boys—M. MEEKER AND C. E. MEYERS
6. Personality correlates of vocational planning—R. BARNETT

VOLUME 84—July-December, 1971

1. Perceptual distortion as a function of stimulus objects, sex, naiveté, and trials using a portable model of the Ames Distorted Room—T. A. GERACE AND W. E. CALDWELL
2. Galvanotaxic behavior and reinforcement of fish *Brachydanio rerio*—W. F. FLANIGAN, JR., AND W. E. CALDWELL
3. Self-actualization, types of personality, and neuroses and psychoses—R. DREISTADT
4. Children's awareness of their bodily appearance: A developmental study of factors associated with the body percept—E. GELLERT, J. S. GIGUS, AND J. COHEN
5. Biomagnetic phenomena: Some implications for the behavioral and neurophysiological sciences—F. RUSSO AND W. E. CALDWELL
6. Sociometric task leadership and the perception of deviance and subsequent conformity as functions of personality—W. L. LIBBY, JR.
7. Murderers who plead insanity: A descriptive factor analytic study of personality, social, and history variables—M. W. KAHN

VOLUME 85—January-June, 1972

1. Children's understanding of negation as a logical operation—S. S. FELDMAN
2. Selective auditory perception of parental voices by the disturbed child—S. SANDERS
3. Identity type, sociometric ratings, and group behavior—C. N. ZIMET AND C. SCHNEIDER
4. Patterns of perceived reaction to frustration among adolescents—J. O. PALMER
5. The need for influence: Development and validation of a measure, and comparison with the need for power—J. S. ULEMAN
6. C. Lloyd Morgan, E. C. Tolman, and comparative method—E. NEWBURY
7. Rethinking motor skills in hemiplegia: Error analysis—L. DILLER, J. BUXBAUM, AND S. CHIOTELIS
8. Effects of participation in rule formation on the moral judgment of children—R. L. MERCHANT AND F. REBELSKY
9. Discrepancy and attention in the five-month infant—C. M. SUPER, J. KAGAN, F. J. MORRISON, M. M. HAITH, AND J. WEIFFENBACH

Genetic Psychology Monographs (continued)

VOLUME 86—July-December, 1972

1. The role of enduring orientations to the environment in personality development—W. C. BRONSON
Is there an error of the standard? A critique of Piaget's perceptual theory—D. A. BEGELMAN AND G. J. STEINFELD
A cross-cultural study of the relationship between resistance to temptation and maternal communication—E. GREENGLASS
The intellectual and achievement effects of preschool cognitive stimulation of poverty Mexican-American children—W. T. PLANT AND M. L. SOUTHERN
2. Factors affecting agnostic behavior in several subhuman species—R. F. GOTTIER
Differential behavioral characteristics of nonpromoted children—J. A. CHASE
An analysis of cognitive-developmental sequences—J. H. FLAVELL

VOLUME 87—January-June, 1973

1. A survey and interpretation of article characteristics: *The Journal of Genetic Psychology* 1945-1969—J. E. HORROCKS AND J. D. HOCAN
The development of listener adapted communications in grade-school children from different social-class backgrounds—K. T. ALVY
Locus of control among schizophrenics and other hospitalized psychiatric patients—T. F. CASH AND J. J. STAG
Interactive styles and social adaptation—C. N. EDWARDS
2. The motivation of exploration strategies in young children—J. D. COIE
Children's representation of the human figure: The effects of models, media, and instructions—C. COLOMB
A perceptual program for classroom teachers: Some results—R. N. WALKER AND J. STREFF
Behavioral approaches to study and treatment of psychogenic tics—M. HERSEN AND R. M. EISLER
Patterns of intellectual development during childhood and adolescence—M. Y. QUERESHI

VOLUME 88—July-December, 1973

1. Adolescent marginality—A further study—J. H. BAMBER
Psychological problems of abortion for the unwed teenage girl—C. D. MARTIN
Perceptual preferences in relation to aspects of personality—L. M. GOODMAN
An exploratory study of personality manifestations in paintings—R. B. BURT
2. A developmental study of cognitive dissonance as a function of level of intellectual performance on Piagetian tasks—A. BIACCIO, G. A. WEGNER, AND S. C. SIMPSON
The validity of parent-child socialization measures: A comparison of the use of assumed and real parent-child similarity with criterion variables—G. COUNT-VAN MANEN
Racial preference and identification of black, American Chinese, and white children—D. J. FOX AND V. B. JORDAN
Obsessional neurosis: Etiology and biopsychological presuppositions. A comparative study involving Freudian and Piagetian theory—R. PIVETTA
Dimensions of competence in young children—F. ALI
Differentiating children's symptom checklist items on the basis of judged severity of psychopathology—E. E. LESSING, H. BEISER, M. KRAUSE, P. DOLINKO, AND S. W. ZAGORIN

VOLUME 89—January-June, 1974

1. Transgression as a function of timing of punishment and age—T. A. CHANDLER
Perception of vocal expression of emotion by hospital staff and patients—H. NASH
Development of geometric imagery in five- to eight-year-olds—C. J. BRAINERD AND K. VANDEN HEUVEL
Modern logic and schizophrenic thinking—D. Y. F. HO
2. Brain dynamism in visual illusions of motion—G. K. YACORZYNSKI
The immediate recognition of tachistoscopically presented visual patterns by backward readers—I. M. CLIFTON-EVEREST
Acquisition of the social desirability response—J. A. WALSH, C. TOMLINSON-KEASEY, AND D. M. KIEGER
The adolescent antecedents of an ego model of coping and defense and comparisons with Q-sorted ideal personalities—N. HAAN
Alfred Binet's remarkable questions: A cross-national and cross-temporal analysis of the cultural biases built into the Stanford-Binet Intelligence Scale and other Binet tests—M. W. SMITH

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

PUBLICATION IN THE JOURNAL OF PSYCHOLOGY

The Journal of Psychology provides a special service to authors and readers. Articles accepted for publication appear in print with the least possible delay. Although editorial standards are the same as those for the other journals, all correspondence and handling are expedited, and the referees may, at their discretion, permit some latitude in length of treatment with respect to tabular material, discussion, and review of the literature.

To save time, authors are requested to exercise unusual care in preparing their papers. Special attention should be paid to the General Instructions on the back cover of each issue and to the announcement on the first preliminary page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

July, 1974
Volume 87, Second Half

(Founded in 1935 by Carl Murchison)

The Journal of PSYCHOLOGY

The General Field of Psychology

If this space should be unstamped, this is the regular library edition. But if this space is stamped with a designating title, this is a special edition, sold under the

restrictions of a bilateral contract, and may not be resold for a period of five years from the date of publication.

JULY, 1974

(Manuscripts are printed in the order of final acceptance)

- Effects of peer-models vs. adult-models and social reinforcement on intentionality of children's moral judgments 159
BY DONALD L. MCMANIS
- Female subjective and pupillary reaction to nude male and female figures . . . 171
BY ROBERT F. HAMEL
- Interrelation of two types of immediate memory in the aged 177
BY HOWARD FRIEDMAN
- A 24-item version of the Miller-Fisk sexual knowledge questionnaire 183
BY HARRISON G. GOUGH
- The development of differentiation in self-evaluations: A cross-cultural study . . 193
BY P. S. FRY

(OVER)

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02656

Changes in attitudes toward physical activity as a result of individualized exercise prescription	203
BY HOMER TOLSON AND JOHN M. CHEVRETTE	
Manifest hostility as modified by the <i>K</i> and <i>So-R</i> scales of the MMPI	209
BY JON VANDEVENTER AND JAMES T. WEBB	
A rational approach to developing and assessing the construct validity of a student learning style scales instrument	213
BY SHERYL WETTER RIECHMANN AND ANTHONY F. GRASHA	
Self-actualization and women's attitudes toward their roles in contemporary society	225
BY LARRY A. HJELLE AND RHONDA BUTTERFIELD	
The effects of peer vs. adult frustration on boys of middle childhood	231
BY LEE SPIELBERG AND RICHARD RUTKIN	
Social comparison of abilities in blind children and adolescents	237
BY STEPHEN F. MORIN AND REGINALD L. JONES	
Information feedback schedules, interpolated activities, and retention	245
BY GARY M. KIPPEL	
A method of clustering persons' profiles	253
BY DONALD B. KEAT, II, AND ROY B. HACKMAN	
Locus of control and achievement—The confirmation of a theoretical expectation	263
BY MARSHALL P. DUKE AND STEPHEN NOWICKI	
Some correlates of Mehrabian's scales of Affiliative Tendency and Sensitivity to Rejection	269
BY D. J. W. STRÜMPFER	
Photographic imagery and the Vietnam war: An unexamined perspective . . .	279
BY KENRICK S. THOMPSON AND ALFRED C. CLARKE	
Intergenerational comparison of attitudes toward basic life concepts	293
BY BARBARA N. ARMSTRONG AND MARTHA M. SCOTZIN	
A consideration of the state of the art of diagnosis in real clinical settings . .	305
BY DARREL EDWARDS, J. SUSAN FICHMAN, STEVEN F. BUCKY, AND N. H. BERRY	
Model reward and imitation: The effect of the presence of the experimenter and the model rewarder	311
BY MARK H. THELEN, NICHOLAS J. REHAGEN, AND T. JOHN AKAMATSU	
The effects of counterattitudinal communication behavior on latitude of acceptance	319
BY MICHAEL BURGOON AND GERALD R. MILLER	

EFFECTS OF PEER-MODELS VS. ADULT-MODELS AND SOCIAL REINFORCEMENT ON INTENTIONALITY OF CHILDREN'S MORAL JUDGMENTS* ^{1,2}

Eastern Washington State College

DONALD L. McMANIS

SUMMARY

Kindergarten and first-grade children giving nonintentional moral judgments were divided into three equated groups ($Ns = 6$), in each of two studies. Two groups performed with models (adult or peer) giving intentionality responses, with the third a control. During training, three Ss and three models in a group performing alternately were given social reinforcement for intentionality responses to Piaget-type stories. On an immediate posttest, both training groups in each study showed significant intentionality response gains from pretest and significantly exceeded their control group ($ps < .05$), while not differing significantly from each other. In study #2, a delayed posttest showed similar training durability for both training groups; both increased nonsignificantly in intentionality responses, continuing to exceed the controls ($ps < .05$).

A. INTRODUCTION

According to Piaget (5), the development of moral judgment progresses through two clear-cut stages, with the demarcation point from the less mature to the more mature stage occurring at approximately seven years of age. In the first stage (objective responsibility), children judge the seriousness of a deviant act in terms of the amount of material damages and disregard the intentionality of the action. In the second stage, children judge such behavior in terms of its underlying intent rather than its material consequences.

During the developmentally earlier stage, the child is operating under

* Received in the Editorial Office on March 25, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Appreciation is expressed to Dr. Jack Martin, principal, and to the teachers of the Eastern Washington State College Campus School for their aid in conducting the study. Gratitude is also extended to the mothers of children involved in the study for their participation.

² The present study was supported by the Child Development Center, Eastern Washington State College.

what Piaget terms a "morality of constraint" which is formed in the context of the unilateral relations between child as inferior and adult as superior. The child accepts the prohibitions and sanctions handed down by adults as moral absolutes which are unquestioned, and his views of wrongdoing are confined to the letter rather than the spirit of the law. A child in this stage does not view morality-relevant actions either in terms of the inner motives of the actor or in terms of the social-interpersonal meaning of an act itself.

With development, the morality of constraint is replaced by a "morality of cooperation" which is formed out of the reciprocal relationships among status peers and based on mutual, rather than unilateral, respect. With growing understanding of the importance of motives in the behaviors of self and others and of the social implications of antisocial behavior, the child becomes aware of the basic reason for morality.

The mechanism that Piaget holds responsible for the development of a rational morality is the same as that which he thinks leads to rational thought in general. Both morality and logic are developed through spontaneous give and take, the interplay of thought and action, which takes place in peer-peer interactions. The prescripts which parents and other adults impose upon the young and egocentric mind are compliantly accepted but at the same time simplified and distorted. It is only through a sharing of perspectives with equals, or peers, that a genuine logic and morality can replace an egocentric moral realism.

In contrast to Piaget's stress on the interaction between peers as the mechanism by which mature moral judgment develops, the social-learning approach to this issue stresses the relationship between a child and his parents or adult caretaker (1). According to this view, a child internalizes his parents' beliefs and values through a process of imitation which leads to the emergence of an independent conscience. The identification process grows out of the dependency relationship which is developed through the mother's caretaking activities in which the child's physical and emotional needs are satisfied. Encouragements, instigations, and controls for behavior that are first carried out by the parents are imitated by the child, who initially may reward himself for proper behavior by self-reinforcement through actively emitting the stimuli provided by the parents. As the child's conforming behavior results in reinforcement, the parent's value system gradually becomes internalized so that the child can become his own caretaker.

While the social-learning approach recognizes the power of the peer group as a source of reinforcement for shaping the child's behavior, the parent-child relationship rather than peer-peer relationships is viewed as the primary source of conscience development.

Bandura and McDonald (2), using adult models, tested the efficacy of social reinforcement and modeling procedures in modifying moral judgment responses discussed by Piaget. One of their findings demonstrated that childrens' immature moral judgments could be modified to a mature level by alternately providing social reinforcement to an adult female model and to the child for making mature judgments. It was demonstrated that moral judgments were susceptible to modification through imitation of models, and that the effects of the treatment procedure generalized on a short-term basis.

Cowan *et al.* (3) replicated the study by Bandura and McDonald, with a more extended analysis indicating that the extent of modeling effects depended upon a number of variables. The immediate posttest judgment results corresponded closely to those reported by Bandura and McDonald. However, it was found that level of pretest scores, type of measure (judgment *vs.* explanation), time between conditioning and posttest, type of item (repeat, new, or switch), and direction of conditioning (up or down) all influenced the modeling effects. Ss with stable low or high level pretest scores (definites) and Ss with intermediate level pretest scores (tentatives) showed comparable amounts of overall change for both judgment and name responses, but this was an artifact of a curvilinear relationship between change and pretest level. The greatest change occurred for Ss with different pretest scores on judgments (three) and on explanations (one), with smaller changes occurring in Ss with more extreme pretest scores on both measures. Ss conditioned up showed most of their learning of judgment responses within the first two conditioning trials, and gradually learned to match their explanations to those of the model. Ss conditioned down, in contrast, showed most of their learning of explanation responses within the first two trials, while gradually matching their judgment responses to those of the model. Up and down Ss showed similar levels of explanation responses during the immediate posttest, both groups being farther in the conditioned direction than the average of the conditioning phase. However, for Ss on the two-week posttest, it was found that Ss conditioned up increased their high level, while Ss conditioned down tended to remain at the conditioning phase level. Examination of explanation responses on the immediate and two-week posttests for the three types of item showed that Ss conditioned up kept going up in the posttests on all three types of items. Ss conditioned down and posttested immediately continued in the conditioned direction for repeat and new items, but showed less tendency to give the model's level of explanation on the switch items in which bad intent and large consequences were paired. Ss conditioned down and posttested after two weeks increased their modeling of repeated items over the last four trials of the conditioning phase, but on the new and switch items they

responded in the model's direction proportionally less often than to the regular items at the end of conditioning. This lowered level of modeling effects in the down-two-week group seemed to indicate a return to their original level of responding. A theoretical analysis showed that neither the present study nor that of Bandura and McDonald could be used directly to affirm or deny Piaget's hypotheses.

The Bandura and McDonald (2) study involved only an immediate posttest at the conclusion of the conditioning phase, and thus provided no data regarding the durability of the changes in moral judgment that had been brought about. Cowan *et al.* (3) did include a delay posttest after a two-week period which examined the short-term stability of the conditioned responses. However, neither of these studies examined the long-term stability of the conditioned responses over an extended period. As Smedslund (6) reported in a study involving the use of direct reinforcement of mature conservation responses, such "artificially" acquired behaviors may be readily discarded by children if they are not supported in their thinking by the notion of logical necessity that occurs through spontaneous development.

One of the purposes of the present study was to examine the long-term stability of intentionality responses acquired through social reinforcement in a modeling situation. A second purpose was to examine the relative effectiveness of adult female models *vs.* age-peer models in producing and maintaining more mature intentionality judgments by children who initially performed at an immature level. The present study followed Bandura and McDonald's procedure of giving social reinforcement to both Ss and models for mature moral judgment responses, with models and Ss performing alternately. Rather than having a single model and a single S perform together, however, the present study combined three Ss and three models in a group for each training session, with Ss and models performing alternately until each group member had performed once in each session. Six Ss and six models were re-assigned for each of 10 training sessions so that each S performed equally often with every model and every other S in his training group. This procedure provided Ss with exposure to a variety of models and also to a variety of peer Ss who received social reinforcement for mature responses, maximizing the opportunity for vicarious reinforcement effects to occur.

Two separate replications of this procedure were conducted. At the time the study was originally designed, follow-up observations during the current school year were planned to examine the stability of the training effects. It was reasoned that if peer-peer interactions provided the mechanism by which moral judgment develops, as stated by Piaget, then the peer-model treatment

should result in more lasting changes. Since Ss in the peer-model group would have more opportunity to become aware during training that their immature judgments were inconsistent with the judgments of their more mature peers, the give-and-take interaction described by Piaget might be expected to carry over more to their peer interactions after training was completed. While the adult-model Ss would also be exposed to peer Ss during training, it should be more difficult for the training effects in this group to carry over to their peer interactions.

Because of delays in beginning the initial study, the end of the school year prevented the follow-up assessments from being conducted while the Ss and peer-models were still in daily contact. Also, during the summer vacation, two peer-model Ss and one control S moved from the area. Thus, in the initial study only the immediate training effect could be evaluated as planned. The study was repeated during the following school year with new Ss and models, with sufficient time allowances made to permit the long-term posttest to be carried out.

B. METHOD

1. Subjects

The Ss in each study were 18 kindergarten and first-grade students in the campus elementary school at Eastern Washington State College. They were selected for the studies on the basis of a pretest for intentionality of moral judgments patterned after the work of Piaget (5). Only Ss who made non-intentional (objective) responses to four or more of six test stories were included in the treatment groups. Ss were assigned to the three treatment conditions solely on the basis of their pretest scores, with the three groups equated as closely as possible for mean pretest score. The pretest means for Ss in each study are presented in Table 1. Although Ss were not assigned to treatment groups on the basis of *CA*, this variable is relevant to the spontaneous development of intentionality in moral judgments and is reported for that reason. The *CA* characteristics of Ss in each study are also presented in Table 1.

The peer models in each study were six students in the campus elementary school from the same grades as the Ss, who gave intentional (subjective) responses to at least five of the six pretest items. The peer models in study #1 had a mean *CA* of 6-8 and a *CA* range of 5-10 to 7-7. The peer models in study #2 had a mean *CA* of 6-7 and a *CA* of 5-10 to 7-3. Since the peer models were selected on the basis of giving mature intentionality responses

on the pretest, having presumably arrived at a mature level of moral development spontaneously, it was not necessary to carry out any training of these children to prepare them to serve as models.

The adult models in study #1 were the mothers of the six children assigned to the adult-model group. Mothers of these children, rather than strangers, were selected in an attempt to assure that their models would have effective social reinforcement power for the children in this groups. In study #2, only two of the adult models were mothers of children assigned to the adult-model group, while the other four adult models were unrelated women over 30 years of age.

2. Materials

The basic materials in each study consisted of pairs of stories, patterned after those used by Piaget (5). In one story of the pair the unintentional actions of a fictitious child produced a serious consequence, while in the other story a less serious consequence resulted from the deliberate misbehavior of another fictitious child. After having both stories read to him by *E*, the *S* was asked to judge which child had none the "naughtiest" thing. After *S* made his judgment, *E* asked him to explain his reason for making that judgment. The order in which the accidental and intentional stories were presented was randomly varied across pairs of stories to control for order preferences on the part of the *Ss*. Six pairs of stories were used for testing purposes, and 60 additional pairs of stories containing the same variation of seriousness of consequence and intentionality were prepared for the training program. The test and training stories were presented in the same order to members of the different treatment groups in each study, to control for possible order effects.

3. Procedure

After the *Ss* had been given the pretest and assigned to treatment groups, the training program was instituted within a period of three weeks. In the training, three *Ss* were paired with three models during each session. *E* began each session by stating that she would read each person stories like the ones they had heard earlier, and that she would ask them questions about the stories as she had before. *E* then began by reading a pair of stories for the first participant (a model was always the first to perform in each session), after which *E* asked the following question (*Q*): "Which child did the naughtiest thing?" After the performer had made his judgment, *E* asked: "Why do you think that was naughtier than what the other child did?" If the explanation did not indicate whether the respondent was basing his judgment on amount of damage or on the intent of the child carrying out the

action, *E* asked him to explain further until the basis of the judgment was clarified.

After the model who performed first each time gave an intentionality response, *E* gave a socially reinforcing (praising or approving) statement while smiling and nodding. After the initial model had performed, an *S* was given a pair of stories, and *Q* was asked. If the *S* also made an intentionality response, *E* provided social reinforcement, while if a nonintentional response was given, *E* withheld reinforcement. The three models and three *S*s grouped together in each training session alternated in their performance until each individual had received one pair of stories, which usually required about 20 minutes per session.

The training program consisted of 10 training sessions for each *S*. In study #1 the training program was conducted over a period of three weeks. In study #2 the training program was conducted over a period of five weeks, with two sessions per week for each *S*. *S*s and models were grouped across the 10 sessions in such a way that each *S* performed equally often with all six of the models and with each of the other five *S*s in his training group. Also, the order in which the *S*s performed during each training session was controlled, so that all *S*s performed second, fourth, and sixth in their group equally often. During the training sessions *E* recorded verbatim the type of judgment made by each participant and his explanation of the judgment.

In study #1, a delayed posttest was administered after summer vacation, three and one-half months following the immediate posttest. In study #2, a delayed posttest also followed the immediate posttest by three and one-half months, occurring two weeks prior to the beginning of summer vacation.

C. RESULTS

1. Study #1

The means and *SD*s of the scores for the *S*s in study #1 on the pretest, the 10 training sessions, and the immediate posttest are presented in the top half of Table 1.

The pretest and immediate posttest scores from #1 summarized in Table 1 were subjected to a mixed two-factor analysis of variance in which the two tests comprised a within subjects variable, and the three treatment conditions a between subjects variable. Results from this analysis showed significant variances associated with the two tests ($F = 208.50$, $1/15$ *df*, $p < .01$), the three treatments ($F = 18.57$, $2/15$ *df*, $p < .01$), and the interaction between tests and treatments ($F = 62.23$, $2/15$ *df*, $p < .01$).

TABLE 1
MEANS AND SDs OF CA, PRETEST, TRAINING, AND POSTTEST SCORES
UNDER THREE TREATMENT CONDITIONS FOR STUDIES 1 AND 2

Condition	CA (years-months)	Pretest	Training	Immediate posttest	Delayed posttest
<i>Study #1</i>					
Peer-model					
Mean	6-5 ^a	1.00	8.16	5.67	—
SD		.82	1.98	.72	—
Adult-model					
Mean	6-8 ^b	.50	8.67	6.00	—
SD		.76	1.08	.00	—
Control					
Mean	6-2 ^c	1.50	—	1.50	—
SD		.76	—	.76	—
<i>Study #2</i>					
Peer-model					
Mean	6-1 ^d	1.50	7.33	4.17	4.50
SD		.76	2.03	1.33	1.26
Adult-model					
Mean	6-0 ^e	1.33	7.83	4.67	5.50
SD		.95	1.97	1.36	.76
Control					
Mean	6-3 ^f	1.50	—	1.17	2.50
SD		.76	—	.90	2.06

Note: Maximum score on pretest and posttest = 6; maximum score during training = 10.

^a Range = 5-8 to 7-7.

^b Range = 5-11 to 7-5.

^c Range = 5-9 to 6-7.

^d Range = 5-7 to 6-4.

^e Range = 5-3 to 6-7.

^f Range = 5-7 to 6-9.

Examination of the means from study #1 in Table 1 shows that performance on the posttest exceeded that on the pretest for the combined groups. The critical difference procedure described by Lindquist (4) was used to carry out multiple comparisons among the three treatment group means for the combined tests and among the individual tests for the three treatment groups. A critical difference of .73 ($p = .05$, 15 df) was obtained for the treatment group comparisons. Application of this figure to the means for the combined tests showed that while the two training groups did not differ significantly from each other, both groups significantly exceeded the control group.

A critical difference of .84 ($p = .05$, 15 df) was obtained for comparisons among the six treatments \times tests means. Application of this figure showed that both the peer-model group and the adult-model group increased significantly from pretest to immediate posttest, while the control group made no significant change. Comparisons among the three treatment groups on the

two tests separately showed that on the pretest the peer-model group did not differ significantly from either of the other two groups, while the adult-model group performed significantly below the control group. On the posttest the two training groups again did not differ significantly, while both of these groups significantly exceeded the control group. The interaction between tests and treatment thus reflected differential changes from pretest to posttest by the treatment groups.

Because of the significant pretest difference that existed between the adult-model group and the control group, an analysis of variance of difference scores was carried out to reduce the influence of pretest performance level. This analysis revealed a significant variance associated with the three treatment conditions ($F = 53.00, 2/15 \text{ df}, p < .01$). A critical difference of 1.22 ($p = .05, 15 \text{ df}$) was obtained for comparisons among the three means. Application of this figure showed that the peer-model and the adult-model groups did not differ significantly in amount of gain made from pretest to posttest, while both of these groups significantly exceeded the control group. These results replicate those obtained using absolute pretest and posttest scores.

2. Study #2

The means and *SDs* of the scores for the *Ss* in study #2 on the pretest, the 10 training sessions, the immediate posttest, and the delayed posttest are presented in the bottom half of Table 1. The pretest, immediate posttest, and delayed posttest scores were subjected to a mixed two-factor analysis of variance. The results of this analysis showed significant variances associated with the three treatment conditions ($F = 12.39, 2/15 \text{ df}, p < .01$), the three tests ($F = 20.72, 2/30 \text{ df}, p < .01$), and the interaction among the three groups and the three tests ($F = 3.92, 4/30 \text{ df}, p < .05$).

A critical difference of .79 ($p = .05, 15 \text{ df}$) was obtained for comparisons among the treatment group means for the combined tests. When this figure was applied, it was found that the peer-model mean (3.39) and the adult-model mean (3.83) did not differ significantly, but both modeling group means significantly exceeded the control mean (1.72).

For multiple comparisons among the three test means, a critical difference of .75 ($p = .05, 30 \text{ df}$) was obtained. Application of this figure to the means for the combined groups on each test showed that performance on the immediate posttest (mean = 3.33) was significantly higher than on the pretest (mean = 1.44). Performance on the delayed posttest (mean = 4.17)

was significantly higher than the immediate posttest and the pretest performances.

The critical difference for multiple comparisons among the nine treatments \times tests means was 1.28 ($p = .05$, 30 *df*). Examination of these means in Table 1 shows that the three treatment groups did not differ significantly on the pretest, but on both the immediate and delayed posttests both modeling groups significantly exceeded the control group. The two modeling groups did not differ significantly on either of the posttests. Both the peer-model group and the adult-model group made significant gains from the pretest of the immediate posttest, and further nonsignificant gains between the immediate and the delayed posttests. The control group showed a nonsignificant decline from the pretest to the immediate posttest, but made a significant gain between the immediate and delayed posttests. However, the control group's delayed posttest performance was still not significantly higher than on the pretest.

D. DISCUSSION

The results in the present study show that both the peer-model and the adult-model treatment conditions were effective in inducing more mature moral judgments of intentionality on a short-term basis for the groups as a whole. However, examination of the individual test protocols revealed that the effects of the training were far from uniform for all individuals receiving training. In study #1, one peer-model *S* showed no conditioning effects at all, while the remaining five *Ss* in this group and all six adult-model *Ss* displayed maximum short-term conditioning. The individual short-term effects in study #2 were more mixed. In the peer-model group, only one *S* showed maximum treatment effects on the immediate posttest, three showed substantial but only partial conditioning, and two continued to perform at essentially their pretest level. In the adult-model group, three *Ss* showed maximum treatment effects, with the other three showing only minimal gains from pretest and incomplete conditioning. It is clear from these results that there is variability in the susceptibility of individual children to the type of training involved in the present study. The greater amount of variability in study #2 among individual *Ss* under both treatment conditions, as compared to study #1, also suggests that the different examiners in these studies had differential effectiveness as reinforcing agents. Also, the difference in the adult models in the two studies could have contributed to the less pronounced adult-model treatment effects in study #2. Examination of the individual protocols for the two *Ss* whose mothers served as models, in comparison to four other *Ss* in this group, fails to support this explanation, however. Of the *Ss* whose mothers

were models, one showed maximum short-term conditioning and the other only slight treatment effects. Among the four Ss whose mothers were not involved in the study, two showed maximum treatment effects and two only partial treatment effects.

The data from study #2 indicate that the long-term stability of the group training effects under both modeling treatments was substantial. Under both treatments the group means showed moderate increases from the immediate to the delayed posttests, which is consistent with the results obtained by Cowan *et al.* (3). Examination of the individual test protocols showed a degree of stability of treatment effects consistent with the group means. In the peer-model group, four Ss who made substantial gains from pretest to immediate posttest showed changes of only one response on the delayed posttest. Two of these Ss improved by one item, while the other two regressed to a less mature response on one item. Of the remaining two peer-model Ss, one who showed no training effect improved by two responses on the delayed posttest, and the other maintained a gain of one response from the pretest. In the adult-model group even greater stability of gains made during training occurred, since none of these Ss showed a performance decrement between the immediate and delayed posttest. Of three Ss who performed at the maximum level after training, all maintained their perfect performance on the delayed posttest. Two Ss who improved by only one response on the immediate posttest made further gains of two and three responses, respectively, on the delayed posttest. The remaining S maintained a gain of two responses, but remained at a transitional level. The continued improvement by three Ss in the peer-model group and by two Ss in the adult-model group could indicate a continuation of the effects of training during the interval between the immediate and delayed posttests. However, examination of the stability of the control Ss' responses between the posttests cautions against this interpretation. One control S, who made no mature responses on either the pretest or the immediate posttest, performed at a maximum level on the delayed posttest. This S apparently acquired the notion of intentionality through spontaneous development during this three and one-half month interval. Two other control Ss who showed no changes from pretest to immediate posttest improved by one and two responses, respectively, on the delayed posttest. Thus, the gains displayed on the delayed posttest by Ss in the modeling groups may well reflect nothing more than the apparent spontaneous development shown by three of the six control Ss.

The results of both studies #1 and #2 fail to support a hypothesis of differential effectiveness of peer *vs.* adult models in inducing intentionality

responses in children. While there was a slightly greater treatment effect produced with adult models in both studies, in neither study was the difference statistically significant in magnitude. The hypothesis that training effects obtained with peer models would be maintained better over an extended time was also not supported in study #2. Not only did the peer-model Ss fail to perform significantly better than the adult-model Ss on the delayed posttest, but the group difference on this posttest favored the adult-model group. This result thus fails to support the speculation that the peer-model training would produce more permanent changes in children in children's moral judgments by more effectively inducing peer-peer interactions of the type described by Piaget as underlying the development of mature moral reasoning.

REFERENCES

1. BALDWIN, A. *Theories of Child Development*. New York: Wiley, 1968.
2. BANDURA, A., & McDONALD, F. J. Influence of social reinforcement and the behavior of models in shaping children's moral judgments. *J. Abn. & Soc. Psychol.*, 1963, **67**, 274-281.
3. COWAN, P. A., LANGER, J., HEAVENRICH, J., & NATHANSON, M. Social learning and Piaget's theory of moral development. *J. Personal. & Soc. Psychol.*, 1969, **11**, 261-274.
4. LINDQUIST, E. F. *Design and Analysis of Experiments in Psychology and Education*. Boston: Houghton Mifflin, 1953.
5. PIAGET, J. *The Moral Judgment of the Child* (1932). New York: Free Press, 1965.
6. SMEDSLUND, J. The acquisition of conservation of substance and weight in children. III. Extinction of conservation of weight acquired "normally" and by means of empirical controls on a balance scale. *Scand. J. Psychol.*, 1961, **2**, 85-87.

Child Development Center
Eastern Washington State College
Cheney, Washington 99004

FEMALE SUBJECTIVE AND PUPILLARY REACTION TO NUDE MALE AND FEMALE FIGURES*

Eastern Michigan University

ROBERT F. HAMEL

SUMMARY

Pupillary responses were recorded for 22 females viewing slides of two male and two female models in sequential degrees of dress and nudity. Subjective reports of sexual arousal were correlated with pupillary reactions to the male models. Dilation was found to be generally in accord with the direction and intensity of subjectively perceived sexual arousal. Dilation to the male models was found to increase in direct relation to the increasing level of exposure. Pupillary response to female models demonstrated no such linear trend. Dilation to the male models was significantly greater than dilation to the female models. The results of the study suggest that pupillary dilation may be a sensitive index of arousal.

A. INTRODUCTION

The present study was designed to explore the relationship between subjective reports of sexual arousal and pupillary response to viewing slides of seminude and nude male and female models. Early studies (2, 3) using pupillary dilation as a measure of human arousal reported increases in dilation relating directly to increases in nudity of visual stimuli. Later research (1, 4) has confirmed these findings. However, Scott, Wells, Wood, and Morgan (6) found both male and female subjects dilating more to seminude opposite-sex pictures than to nude, and males dilating more to male models than to female models. Peavler and McLaughlin (5) reported evidence that pupillary response did not correlate with the direction of self-reported sexual arousal. Since the two preceding investigations are contradictory to both expectation and previous research it is expected that both studies are limited in their generality.

A larger number of data points than was utilized in either the Scott *et al.* or Peavler and McLaughlin studies cited above, for both self-reports and

* Received in the Editorial Office on March 25, 1974, and published immediately at Provincetown Massachusetts. Copyright by The Journal Press.

pupillary dilation, was used in the present investigation to test the generality of the above findings.

B. METHOD

1. Subjects

The Ss were 22 female undergraduate students at New York State University College at Oswego ranging in age from 18 to 22.

2. Apparatus

A Pupillometer System, model V-1165-1R, was used to measure pupillary dilation in millimeters, recording at a constant rate of eight inches per minute.

Thirty-two slides were prepared, 16 stimulus and 16 control, and were projected onto the rear of a 14" \times 14" translucent screen, positioned as the front panel of a 14" \times 18" \times 20" black viewing box. The control slides, tinted dark red with the letter "A" (15/16" high) centered on the slide, were used to return pupil size to base level. Stimulus slides consisted of four slides of each of two male models and each of two female models, as follows: (a) fully clothed, (b) in underwear (bras and briefs for the females; undershirt and briefs for the males), (c) in briefs with torsos exposed, and (d) nude.

Luminance was measured with a Gossen light meter at five points on each slide: at the center and one inch inward from each corner. A neutral density lens filter was fitted onto the projector lens to reduce and equalize contrast between slides and further reduce luminance incidence.

Photographic prints were made from each male stimulus slide and placed into a folder with a rank-order self-report score sheet. All slides and pictures were color prints.

3. Procedure

All Ss were told they would be viewing pictures of male and female figures in varying degrees of dress and nudity. Voluntary participation was emphasized. Each S was seated at the Pupillometer System and either viewed eight like-sex slides followed by eight opposite-sex slides, or eight opposite-sex slides followed by eight like-sex slides. During the presentation of each set of eight opposite-sex and like-sex slides, the first model was shown in order of increasing degree of nudity, and the second model in decreasing degree of nudity. Control slides were used to reduce dilation to base level and were presented immediately preceding each slide set. Base level was individual,

ranging from approximately 2.95 to 5.1 mm. Slides were presented at five second intervals with an approximate total viewing time for each *S* of two and one-half minutes.

Each *S* was then given the folder containing the opposite-sex prints and the self-report form. She was first asked to indicate whether she had been sexually aroused by any of the slides and then asked to recall the slides and rank order the pictures according to their perceived arousal level. Each print corresponded with a previously viewed slide.

C. RESULTS

Mean dilation for each *S* was found over each of the five second stimulus slide presentations. The responses were then separated out for each model such that there were 22 measures calculated to each of the 16 stimulus slides. In increasing order of nudity, mean dilations (in mm) to each model were as follows: Male Model 1, 4.388, 4.660, 4.905, and 5.150; Male Model 2, 4.483, 4.672, 4.697, and 4.907; Female Model 1, 4.274, 4.537, 4.711, and 4.804; Female Model 2, 4.207, 4.495, 4.521, and 4.416.

An analysis of variance and a linear trend analysis were applied to each of the four sets of data. A significant difference between means was found for Male Model 1 ($F = 3.041$, $df = 3/84$, $p < .05$). The variance was equally distributed in an almost perfectly linear manner ($F = 9.116$, $df = 1/84$, $p < .005$). Deviations away from linearity were practically nonexistent for any data point ($F = .003$, $df = 2/84$).

While no other significant findings were uncovered at the .05 level for the other three models, the degree of linearity for Male Model 2 was near significance ($F = 3.362$, $df = 1/84$, $p < .08$), with deviations away from linearity being negligible ($F = .125$, $df = 2/84$). Dilation to the female models demonstrated no significance between means and no linear trend whatsoever.

All mean responses were combined into four groups, according to sex of model, representing increasing degree of nudity. A 2×4 analysis of variance was then applied to the data. A significant difference in dilation was found between the opposite- and like-sex slides ($F = 3.362$, $df = 3/344$, $p < .05$), with the male models eliciting greater dilation. There was also found significant variance between degrees of nudity, with the totally nude models eliciting the greatest dilation ($F = 4.443$, $df = 1/344$, $p < .05$). No interaction effect was found.

Self-reports and pupillary dilation were correlated in the following way. Because the nature of the self-reports forced the *Ss* to discriminate between the slides, where in fact discrimination might have been impossible for the

Ss to determine, the rank orders 3 through 6 were eliminated from the calculations. Thus only the slides eliciting the greatest reported arousal (ranks 7 and 8) and the least reported arousal (ranks 1 and 2) were correlated with their respective pupillary responses which were rank ordered according to their comparative levels. Although the correlation was only .387, this proved significant at the .01 level. All Ss reported experiencing some sexual arousal to the male models.

D. DISCUSSION

The results of the present investigation appear to refute the findings of both Scott *et al.* (6) and Peavler and McLaughlin (5), and to call into question the generality of their findings. In accord with previous research (1), viewing opposite-sex pictures in order of increasing nudity for females, produced proportionately greater pupillary dilation. Although female pupillary response increased with respect to the sequential ordering of the slides depicting male and female figures at increasing levels of exposure for both male models and for one female model, only dilation to the male figures demonstrated linearity. Greatest dilation was recorded in response to the totally nude males, and the least reactions were recorded to the pictures of the fully clothed female models. At no point did dilation to the female figures exceed the responses to the male figures. Furthermore, the finding that there was significantly greater dilation to the male models than to the female models suggests, contrary to Zuckerman (7), that pupillary dilation can be discriminative to the sex of the stimuli. Zuckerman had initially pointed out in his review of the literature that pupillary dilation measures did not discriminatively respond to male and female models.

The fact that dilation to Male Model 2 did not demonstrate linearity was contrary to expectation. Following a reanalysis of the data, it was found that while dilation to this model for slides 1, 2, and 4 were significantly linear ($p < .01$), the only deviation away from linearity was the response to the picture of the model with only his torso exposed (slide 3). Following the experiment, it was recalled that several subjects had commented on the amount of body hair exhibited on the chest of this model as compared to the other male model. The initial exposure to slide 3 and the subsequent decrease in dilation might thus reflect the adversity or novelty of the stimuli. Which-ever effect was in operation at the time of presentation served to inhibit pupillary response. The inhibition of pupillary response by the adversity or novelty of the stimuli characteristics appears to demonstrate the sensitivity of pupillary reaction to sexual, novel, or adverse stimuli. Further research

should be attempted to assess the generality of such an effect and to determine the implications of such a finding in relation to the use of pupillary dilation as a measure of general activation. If it is in fact discovered that such an effect is a general reaction to adverse stimuli characteristics, it might be assumed that pupillary dilation can adequately differentiate between adverse and sexual arousal, and thus negate the position that dilation indiscriminatively responds to the two types of arousal (7).

That pupillary dilation is sensitive to the direction and level of sexual arousal has been demonstrated by correlating the subjective reports of subject arousal with their corresponding dilation intensity. While the correlation was somewhat low, it did however prove significant. One supportive factor of the relative significance of this finding is the fact that a large number of measures ($N = 176$) were correlated. This is in contrast to the small sample size used in the Peavler and McLaughlin study (5) in which it was found that pupillary dilation did not reflect the general direction of reported sexual arousal.

While the question of whether pupillary dilation is, in fact, a reliable and valid index of sexual arousal remains open to further speculation and investigation, the results of the present study suggest that the measure may well prove to be a sensitive indicator of arousal and arousal intensity. The generality of such findings, however, must yet be borne out by further research.

REFERENCES

1. HAMEL, R. The effect of visual sexual stimuli on the pupillary response of females. Unpublished manuscript. Eastern Michigan University, Ypsilanti, 1974.
2. HESS, E., & POLT, J. Pupil size as related to interest value of visual stimuli. *Science*, 1960, **132**, 349-350.
3. HESS, E., SELTZER, A., & SCHLIEN, J. Pupil response of hetero- and homosexual males to pictures of men and women: A pilot study. *J. Abn. Psychol.*, 1965, **70**, 165-168.
4. NUNNALLY, J., KNOTT, P., DUCHNOWSKI, A., & PARKER, R. Pupillary response as a general measure of activation. *Percept. & Psychophys.*, 1967, **2**, 149-155.
5. PEAVLER, W., & McLAUGHLIN, J. The question of stimulus content and pupil size. *Psychon. Sci.*, 1967, **8**, 505-506.
6. SCOTT, T., WELLS, W., WOOD, D., & MORGAN, D. Pupillary response and sexual interest reexamined. *J. Clin. Psychol.*, 1967, **23**, 433-438.
7. ZUCKERMAN, M. Physiological measures of sexual arousal in the human. *Psychol. Bull.*, 1971, **75**, 297-329.

Department of Psychology
Eastern Michigan University
Ypsilanti, Michigan 48197

INTERRELATION OF TWO TYPES OF IMMEDIATE MEMORY IN THE AGED*

*Veterans Administration Hospital and State University of
New York Upstate Medical Center, Syracuse, New York*

HOWARD FRIEDMAN

SUMMARY

The interrelationship of digit span and word span was studied in a group of 112 females, 17-81 years of age. When the subjects were assigned to groups of 38 young ($\bar{X} = 25.6$ years), 39 middle-aged ($\bar{X} = 53.2$ years), and 35 old ($\bar{X} = 73.3$ years), the correlation between the two types of span was larger in the old than in the young, reflecting a predicted greater degree of homogeneity of functioning. When spans were scored without consideration for exact order of recall, this finding no longer held, as was the case with a capacity decrement in digit span with the aged, thus reflecting the importance of the organizational factor in senescent memory ability.

A. INTRODUCTION

In an earlier study, Friedman (1) demonstrated that the immediate memory functioning of aged subjects could be comprehended within a genetic conceptual framework that has been widely applied in the understanding of the structural aspects of mental development. Thus, Werner's (9) general developmental law, which conceives of steadily increasing differentiation and hierarchic integration as the essence of all organic development, permitted the hypothesis that senescent subjects would function, in terms of memory organization, at a level reflecting less differentiation and hierarchization than that possessed by younger adults. The hypothesis derived from the same genetic framework was in keeping also with an earlier study by Rochwarg (6) dealing with the structural aspects of perception in healthy aged subjects. Yet another fruitful application of this framework appeared in an investigation of action patterns of the aged by Friedman (2).

The findings of the study in memory organization (1) not only indicated that the aged group performed significantly more poorly than the young

* Received in the Editorial Office on April 3, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

group in retaining material that exceeded the subject's capacity, but also highlighted the importance of the organizational factor. Thus, the significant differences found between groups, based on scoring of recall in exact order of stimuli presentation, were not observed when span was scored *without* concern for correctness of order of recall.

The heuristic value of this genetic framework can be further demonstrated by deriving substantially the same hypothesis as was done previously (1), but now investigating the interrelational aspects between two different types of memory material rather than performance capacity in any one type. Werner (8) has discussed the development of memory from the standpoint of an increase in specificity. With development, the trend toward specialization in types of memory material is exemplified in studies he reports that show no correlation at the college level between immediate memory for various visual material, vocabulary, and number operations. As the ontogenetic scale is descended, however, there is, as expected, a closer relationship between the various memory areas, and a high correlation at the preschool level was observed. Thus, mental organization can be conceived of as proceeding developmentally from the less differentiated, more homogeneous at earlier levels to the more differentiated, specific, and hierarchically integrated at later stages. As in the previous study, if memory organization in the senescent can be understood in terms of a loss in differentiation and hierarchization, the obverse of the developmental pattern, this should be reflected in a significant difference in specificity of memory between an aged group and comparable younger populations. Specifically, the hypothesis is that in a senescent group of subjects the relationship between performance on different types of memory will be greater than that observed in younger subjects.

B. METHOD

1. Subjects

The subjects, 112 females ranging in age from 17-81 years, were obtained from hospital employees and volunteer workers, and from local senior citizen clubs which provided a number of physically healthy, active members. Division into three groups was made: young, under 40 years of age ($N = 38$, $\bar{X} = 25.6$ years); old, over 65 years ($N = 35$, $\bar{X} = 73.3$ years); and middle-aged, 40-65 years ($N = 39$, $\bar{X} = 53.2$ years).

The vocabulary subtest of the Wechsler Adult Intelligence Scale (WAIS) was administered to provide an estimate of intellectual functioning least sensitive to aging, and mean raw scores of 51.2 ($\sigma = 11.2$), 52.0 ($\sigma = 12.7$),

and 48.4 ($\sigma = 10.9$) were obtained for the young, middle-aged, and old groups, respectively. Analysis of variance showed no significant age-related differences.

2. Stimuli and Apparatus

Two memory tasks were used to test for immediate recall of digits and words. Thus, in Task 1 (Digit Span), sequences of two to nine randomized typed digits were presented by means of a paper belt and memory drum at the rate of one digit per 2.0 seconds. The same digit was not presented more than once within a given sequence, and no consecutive numbers were in normal counting order. The typewritten word "READY" signaled the beginning of each sequence, and an asterisk indicated trial completion. The memory drum was placed on a 26-inch high table at which the subject sat.

In Task 2, sequences of two to nine monosyllabic nouns were presented by means of a Kodak Carousel 700 Projector which was programmed to present the stimuli at the rate of one word per 3 seconds, with each word visible for the full 3-second duration. The image, 4.5 inches in height, was approximately eye level, and the subject sat in a chair 9 feet from it. In any series, the same noun never appeared more than once. The word "READY" was uttered by the examiner to indicate each trial beginning, and a blank slide indicated trial completion.

3. Procedure

All subjects were tested individually in a room which could be darkened and in which intrusive distracting sounds were minimized. Prior to the tasks, the WAIS vocabulary test was administered. The two memory tasks were then presented in counterbalanced order. In each task the subject was instructed to view each sequence and repeat the stimulus aloud as seen. Upon seeing the asterisk or blank slide, the subject was instructed to report orally the numbers or words seen in exactly the same order as presented. The examiner recorded each item as reported, and intertrial interval was subject-paced. Sequences were presented in order of increasing length from two to nine items. The subject received two sequences at each series length until both responses were incorrect, at which point the task was stopped, and the longest series length reported correctly was considered the digit or word span. Although the subject was required to report sequence back in order, a response was considered correct for purposes of continuing with increasing sequence length if all items were recalled regardless of order.

Test periods were all single sessions lasting approximately 30 minutes.

C. RESULTS

With memory span determined by recall in exact order of stimulus presentation, intercorrelations of digits and words of .333, .386, and .739 were obtained from the young, middle-aged, and old groups, respectively. The difference between the intercorrelations of the three samples was tested by use of the V statistic (3), and statistical significance ($p < .03$) was indicated by a chi square value of 7.26 ($df = 2$).

Since the scoring of span based on recall of material in exact order of stimuli presentation requires maximum organization by the subject, a less stringent scoring (i. e., recall without penalty for inexact order) might provide a clue as to the effect of lesser organizational requirements upon the intercorrelations of the three groups. When this was done, intercorrelations of .607, .367, and .476 were obtained for the young, middle-aged, and old groups, respectively, with no statistically significant difference between the intercorrelations.

In an attempt to highlight the effects of organization further, the capacity differences of the young and old groups were examined independently for digits and words. When spans were based on exact order of recall of presented material, the young group showed by t test statistically significantly larger spans in both digits and words. To de-emphasize organization of recalled material, spans were rescored without requiring exact order in recall. Although this resulted in no change in memory span for words (i. e., the young group still maintained a statistically significant advantage in capacity of span), there was a revealing change in memory for digits. Thus, digit span based on exact order of recall of presented material had mean spans of 6.40 ($\sigma = 1.24$) for the young and 5.77 ($\sigma = 1.26$) for the old, a difference which is statistically significant by t test ($p < .05$). When correctness of order of recall was ignored in scoring for span, the means were 6.89 ($\sigma = 1.25$) for the young group and 6.34 ($\sigma = 1.24$) for the old, indicating a difference between means which is not statistically significant ($p > .05$).

D. DISCUSSION

The hypothesis of greater interrelationship between two types of memory in an aged population as compared to a younger group of subjects is confirmed. The present findings are consistent with Hulicka (4) who, in studying age differences in scores of a memory scale, reported intertest correlations increasing with age. Thus, additional evidence is offered in terms of comprehending the functioning of the aged as more homogeneous than the

younger, and as such, undergoing a loss in differentiation and hierarchic integration. That the organizational factor is of considerable importance, as suggested in a previous study (1), is highlighted when digit span and word span are scored without consideration for order. Under such conditions the significant differences in intercorrelations between young and old disappear. From the standpoint of capacity differences between young and old, which are well-documented in the literature (5, 7), the decrements observed in the aged are minimized, at least in dealing with memory for digits, when span is not based on exact order of recall. Thus, with digits, a statistically significant decrement in mean span between the young and senescent groups of the 17-81-year-old population herein studied is no longer present when span for recall without requiring exact order is compared.

The findings, therefore, support the understanding of the immediate memory decrement of the old as another aspect of differences in differentiation and hierarchic integration. The decrement may be attributed not so much to sheer capacity levels, but to differences in organizational requirements. Thus, when rigid organization of material is not required, as in recall without exact order, the less differentiated functioning and the immediate memory decrement tend to disappear.

REFERENCES

1. FRIEDMAN, H. Memory organization in the aged. *J. Genet. Psychol.*, 1966, **109**, 3-8.
2. ———. Action patterns in the aged. *J. Genet. Psychol.*, 1967, **110**, 153-157.
3. HAYS, W. L. *Statistics for the Social Sciences* (2nd ed.). New York: Holt, Rinehart & Winston, 1973. P. 664.
4. HULICKA, I. M. Age differences in Wechsler Memory Scale scores. *J. Genet. Psychol.*, 1966, **109**, 135-145.
5. INGLIS, J. Immediate memory, age, and brain function. In A. T. Welford & E. Birren (Eds.), *Behavior, Aging, and the Nervous System*. Springfield, Ill.: Thomas, 1965. Pp. 88-113.
6. ROCHWARG, H. Changes in the structural aspects of perception in the aged: An analysis by means of the Rorschach Test. Unpublished Doctor's dissertation, Eastern Michigan University, Ypsilanti, 1954.
7. TAUB, H. A. A comparison of young adult and old groups on various digit span tasks. *Devel. Psychol.*, 1972, **6**, 60-65.
8. WERNER, H. Genetic psychology, experimental. In P. L. Harriman (Ed.), *Encyclopedia of Psychology*. New York: Philosophical Library, Citadel Press, 1946. Pp. 219-236.
9. ———. *Comparative Psychology of Mental Development* (rev. ed.). New York: Internat. Univ. Press, 1957.

Psychology Service
Veterans Administration Hospital
Syracuse, New York 13210

A 24-ITEM VERSION OF THE MILLER-FISK SEXUAL KNOWLEDGE QUESTIONNAIRE*¹

*Institute of Personality Assessment and Research,
University of California, Berkeley*

HARRISON G. GOUGH

SUMMARY

A brief, reliable measure of sexual knowledge would be of obvious value in studies of family planning, population, and related issues. A 49-item test of sexual information was created by Miller and Fisk in 1969. Analysis of this device on a sample of 104 Ss suggested that a shorter and more convenient version could be developed. Deletion of 25 questions with weak or unacceptable statistical properties left 24 items for retention in a revised questionnaire. This 24-item version was then administered to new samples including 287 males and 246 females, permitting specification of provisional normative and interpretational data.

A. VALUE OF A TEST FOR SEXUAL KNOWLEDGE

The utility of a brief measure of sexual knowledge for studies of family planning, contraceptive preferences, attitudes toward abortion, and other issues in the population domain is self-evident. In 1969 at the Stanford University School of Medicine, Warren B. Miller, a psychiatrist, and Norman M. Fisk, an obstetrician-gynecologist, developed a 49-item sexual knowledge questionnaire for use with lay Ss.² Their test included questions on reproductive physiology, effectiveness of different methods of contraception, menstrual functioning, and factors influencing sex drive and fertility.

Tryout of the Miller-Fisk questionnaire in work with college students and adults suggested that some of the items might be too difficult, and also that a shortened version would be more convenient than the original 49-item test in a battery of assessment devices intended to supplement field interviews in

* Received in the Editorial Office on April 8, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This study was supported by grant No. NIH-HD-06589-02 from the National Institute of Child Health and Human Development, United States Public Health Service.

² The writer wishes to thank Drs. Warren Miller and Norman Fisk for their kindness in permitting use of their Sexual Knowledge Questionnaire and citation of items in the text and Table 1 of this paper.

both American and cross-cultural inquiries. An investigation was therefore initiated to determine whether an abbreviated edition could be developed that would retain the range of content and statistical reliability of the original.

B. ANALYSIS OF THE 49-ITEM SCALE

In order for the investigators to carry out an item analysis of the questionnaire, samples of 29 males and 75 females were administered the original form. Fifteen of the males were adults seen in various interview inquiries, and 14 were college students participating in the testing to satisfy course laboratory requirements; 35 of the women were from the noncollege community, and 40 were students. The 29 males had a mean score of 31.38 $SD = 5.24$, on the questionnaire, and the 75 females had a mean of 34.97, $SD = 4.51$.

Item analyses were then conducted, examining the percentages in each subsample answering correctly, and point-biserial correlations were computed between a correct answer on an item and total score. Four kinds of items were identified as candidates for deletion. One of the criteria specified was too low a correlation between an item and total score. An example may be given:

What percent of normal married couples engaging in reasonably frequent sexual relations without contraception will achieve pregnancy in a period of 12 months? (a) 20 to 25%; (b) 40 to 50%; (c) 65 to 75%; (d) 80 to 90%.

The scored option is "d," with 38% of the males and 40% of the females selecting this response. The correlations between a correct answer to this item and total score on the scale were .15 for males, .05 for females, and .08 for the total sample of 104 Ss. The item was therefore rejected.

A second reason for dropping an item was too great a sex difference in either percentage correct or item *vs.* total score validity. The item below is an example:

A woman who begins her menstrual flow on December 2 and has a four-day period and again menstruates from December 27 until December 31 has a cycle that is: (a) 29 days; (b) 25 days; (c) 21 days; (d) abnormal.

The correct answer is "b," given by 52% of the males and 63% of the females. Although this difference is not particularly great, the point-biserial coefficients of .15 for men and .56 for women are distinctly discrepant, and the item was therefore deleted.

A third criterion for evaluating items was the level of difficulty, with items to be dropped if either too hard or too easy. An example of an item judged to be too difficult is the following:

Most normal adult women produce at least one ovum (egg) every month:
(a) true; (b) false.

False is the scored answer, chosen by only 10% of the male sample and 7% of the female. The item also revealed a $-.15$ correlation with total score in the male sample, and therefore would also be rejected on that basis.

An item judged to be too easy was the following:

Birth control pills usually decrease sexual satisfaction: (a) true; (b) false.

Again, false is the scored answer, selected by 100% of the males and 99% of the females. With so little variation in reply it is not surprising that the point-biserial correlations with total score were low, $.00$ for men and $.05$ for women.

By applying the criteria just indicated, it was possible to shorten the 49-item scale to a set of 24 questions, equally divided between four-option multiple choice and true-false items. In the sample of 29 males the revised 24-item measure correlated $.94$ with the original test, and in the sample of 75 females the correlation was $.92$. The males attained a mean of 14.83 , $SD = 4.27$, on the abbreviated scale, and the females attained a mean of 17.56 , $SD = 3.22$. This difference is statistically significant ($p \leq .01$) and in agreement with subsequent testing with the new version where women have consistently scored higher than men.

C. ANALYSIS OF THE 24-ITEM SCALE

The 24 items retained in the shortened scale were printed in a new format and administered to several new samples. The first included 209 male and 146 female college students, tested in conjunction with laboratory assignments in introductory psychology classes at Berkeley. The second included 78 males (25 adults, 44 students) and 100 females (60 adults, 40 students) described in a previous paper by the author on contraceptive preferences (3).

Item data for the 209 college men and 146 women are given in Table 1. The percentages of Ss choosing each option for the 24 questions are given, along with the point-biserial correlations between correct answer to the item and total score, computed on the total sample of 355 students.

All 24 of the point-biserial coefficients reported in Table 1 are statistically significant beyond the $.01$ level of probability, suggesting that an acceptable degree of internal consistency was achieved in the revised questionnaire. Several of the items turned out to be rather easy (e. g., No. 20 and No. 24), but without loss of item *vs.* total score validity. The most difficult item was No. 3, which asks about the length of time following release from the ovary

TABLE 1
ITEM STATISTICS FOR THE MILLER-FISK SEXUAL KNOWLEDGE QUESTIONNAIRE
IN THE SAMPLES INDICATED

Item	Males (<i>N</i> = 209)	% choosing Females (<i>N</i> = 146)	Total (<i>N</i> = 355)	<i>r</i> _{p.bis}
1. The single most important factor in achieving pregnancy is				
<i>a.</i> Time of exposure in the cycle*	67	71	69	.43
<i>b.</i> Female's desire or wish to become pregnant	13	10	12	
<i>c.</i> Frequency of intercourse	15	11	13	
<i>d.</i> Female's overall state of health	5	8	6	
2. Which of the following is the most dependable (effective) method of contraception or birth control?				
<i>a.</i> Condom (male prophylactic)	22	1	13	.38
<i>b.</i> Diaphragm plus jelly or cream	4	2	3	
<i>c.</i> Rhythm	3	0	2	
<i>d.</i> Pill*	71	97	82	
3. Following release from the ovary the human ovum (egg) is capable of being fertilized for				
<i>a.</i> 6 to 12 hours	14	18	15	.22
<i>b.</i> 24 hours	14	15	15	
<i>c.</i> 48 hours*	26	31	28	
<i>d.</i> 4 to 6 days	46	36	42	
4. A good index of a female's relative fertility (ability to achieve pregnancy) is				
<i>a.</i> Her overall health	32	44	36	.22
<i>b.</i> The regularity of her periods*	64	51	59	
<i>c.</i> The level of intensity of her sex drive	2	2	2	
<i>d.</i> Her ability to achieve orgasm	2	3	3	
5. Which of the following methods of contraception is most effective?				
<i>a.</i> Condom (male prophylactic)	43	12	30	.39
<i>b.</i> Rhythm	1	2	2	
<i>c.</i> Diaphragm plus jelly or cream	14	16	15	
<i>d.</i> Intrauterine device (loop or bow)*	42	70	53	
6. The normal female most often ovulates (gives off egg)				
<i>a.</i> Two weeks before the onset of menstruation*	53	73	61	.45
<i>b.</i> Just prior to menstruation	22	16	20	
<i>c.</i> Immediately following menstruation	17	6	12	
<i>d.</i> At unpredictable times throughout the cycle	8	5	7	

TABLE 1 (continued)

Item	Males (<i>N</i> = 209)	% choosing Females (<i>N</i> = 146)	Total (<i>N</i> = 355)	<i>r</i> _{p.bis}
7. Infertility (inability to achieve pregnancy) is				
a. Familial or inherited	14	15	15	
b. A male problem in one-third of cases*	48	53	50	.37
c. A female problem in 90% of the cases	19	15	17	
d. Easily diagnosed after six months of marriage	19	17	18	
8. Which of the following is the poorest or least dependable method of contraception?				
a. Condom (male prophylactic)	1	1	1	
b. Diaphragm	0	0	0	
c. Postintercourse douching*	62	73	66	.21
d. Rhythm	37	27	33	
9. A normal human ovum (egg) is approximately the same size as				
a. A pinhead*	54	50	52	.19
b. A small pearl	8	7	8	
c. A dime	2	1	2	
d. None of the above	36	42	38	
10. Fertilization (union of sperm and egg) normally occurs in which of the following anatomical locations?				
a. The uterus (womb)	44	50	47	
b. The cervix (mouth of womb)	18	12	16	
c. The tube*	35	34	35	.38
d. The vagina	3	4	4	
11. Menopause is a time of				
a. Diminished sexual drive	10	2	7	
b. Absolute infertility	13	17	15	
c. Rapid aging	4	0	2	
d. Altered reproductive and menstrual functioning*	73	81	76	.41
12. The rhythm method of contraception is				
a. Always effective	0	0	0	
b. Avoidance of intercourse during unsafe (or fertile) time*	79	87	82	.53
c. A technique of intercourse	12	5	9	
d. None of the above	9	8	9	
13. Pregnancy would be impossible in early adolescence when menstruation has not yet even begun or is not at all regularly established.				
a. True	45	51	48	
b. False*	55	49	52	.36

TABLE 1 (*continued*)

Item	Males (<i>N</i> = 209)	% choosing Females (<i>N</i> = 146)	Total (<i>N</i> = 355)	<i>r</i> _{p.bis}
14. Menstrual blood is similar to a body "poison" or toxin that must be eliminated in order for a woman to remain healthy.				
<i>a.</i> True	29	22	26	
<i>b.</i> False*	71	78	74	.44
15. A woman who begins to menstruate on the first Wednesday of every month is "as regular as a clock."				
<i>a.</i> True	34	42	37	
<i>b.</i> False*	66	58	63	.40
16. In order to have a normal period there must be a moderate to heavy flow in terms of amount of blood and/or duration of flow.				
<i>a.</i> True	27	16	23	
<i>b.</i> False*	73	84	77	.45
17. The loss of one ovary through disease or surgery diminishes a woman's fertility (ability to conceive) little if at all.				
<i>a.</i> True*	62	56	59	
<i>b.</i> False	38	44	41	.35
18. Anatomical differences (i. e., size, shape, capacity, etc.) of the genital organs has a great bearing on sexual compatibility or satisfaction.				
<i>a.</i> True	14	24	18	
<i>b.</i> False*	86	76	82	.37
19. Unplanned or undesired pregnancies have a greater likelihood of miscarrying than do planned pregnancies.				
<i>a.</i> True	50	32	42	
<i>b.</i> False*	50	68	58	.24
20. Failure to have an orgasm on the part of the female eliminates or substantially reduces the likelihood of becoming pregnant.				
<i>a.</i> True	8	8	8	
<i>b.</i> False*	92	92	92	.40
21. Withdrawal is an effective means of contraception (birth control).				
<i>a.</i> True	17	14	15	
<i>b.</i> False*	83	86	85	.33

TABLE 1 (continued)

Item	Males (<i>N</i> = 209)	% choosing Females (<i>N</i> = 146)	Total (<i>N</i> = 355)	<i>r</i> _{p.bis}
22. Birth control pills directly increase the sex drive (desire) in most women.				
<i>a.</i> True	9	10	9	
<i>b.</i> False*	91	90	91	.32
23. Sperm retain their ability to fertilize (cause pregnancy) for one to two days following ejaculation (release).				
<i>a.</i> True*	57	58	57	.30
<i>b.</i> False	43	42	43	
24. Most women are more fertile during one particular season of the year than another.				
<i>a.</i> True	10	12	11	
<i>b.</i> False*	90	88	89	.41

* Correct answer.

that the ovum remains capable of being fertilized. This was also one of two items for which an incorrect option was often selected than a correct response; the other item on which this occurred was No. 10, where the query concerned locus of fertilization.

Odd-even reliability coefficients were computed for males, females, and the total sample of 355. Corrected coefficients were .70, .62, and .67, respectively. These were judged acceptable for an instrument intended for research purposes. For the 24-item scale, males attained a mean of 15.51, *SD* = 3.77, females had a mean of 16.55, *SD* = 3.47, and the total sample a mean of 15.94, *SD* = 3.69. The difference of 1.04 between female and male subjects, although small, gave a *t* ratio of 2.68, *p* ≤ .01.

D. RELATIONSHIPS TO OTHER VARIABLES

Table 2 presents information relating the sexual knowledge test to other variables. The sample of 78 males and 100 females was already been mentioned. The sample of 91 males was composed of those students who took the College Vocabulary Test, Form A (5) in their laboratory work, and the sample of 67 females was composed of those who also took the verbal measure.

Age, for both sexes, is essentially unrelated to scores on the sexual information test. If younger samples (e. g., high school or junior high school) had been used, one would anticipate more positive relationships. From ages 18

TABLE 2
CORRELATIONS BETWEEN THE SEXUAL KNOWLEDGE QUESTIONNAIRE AND OTHER VARIABLES

Variables	Males				Females			
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>r</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>r</i>
Age	78	29.58	13.88	.02	100	28.87	10.82	.14
College Vocabulary Test	91	32.55	9.78	.21*	67	32.85	11.15	.26*
Personal Values Abstract								
<i>a.</i> Modernity	78	21.53	3.51	.16	100	20.63	4.39	.25*
<i>b.</i> Socialization	78	23.50	3.80	.10	100	23.80	3.68	.19
<i>c.</i> Femininity	78	15.78	3.16	-.24*	100	21.19	2.96	.29**
Rotter Locus of Control	78	10.10	4.01	-.15	100	10.05	4.47	-.02

* $p \leq .05$.

** $p \leq .01$.

or 19 on up to full adulthood sexual information scores do not appear to be correlated with age.

On the College Vocabulary Test, low but significant ($p \leq .05$) correlations were observed for both sexes. For research purposes one would not want a sexual information test which was only a variant of vocabulary or word-knowledge in general; at the same time, one would not expect to find information in one verbal sphere to be completely unrelated to that in another. The coefficients of .21 and .26 appear to be close to the desideratum implied by these two remarks.

The Personal Values Abstract (2, 4) is a 97-item self-report personality inventory intended for use in family planning and population studies, and in other settings where testing time is severely limited. The Abstract can be administered in from 10 to 15 minutes, and scored in seconds. Its scales seek to assess important facets of normative behavior: i. e., norm-setting, norm-changing, and norm-maintaining dispositions.

Modernity reflects attitudes of rationality, secularism, and progressivism *versus* traditionalism and conventionality. The modernity scale was not significantly related to sexual knowledge among men, but the correlation of .25 for women was significant at the .05 level of probability.

The socialization scale attempts to assess the degree to which cultural imperatives have been internalized. Whereas modernity deals with role manifestations of personality, socialization pertains to character. The socialization scale was not significantly related to sexual information for either men or women.

The femininity scale seeks to assess a continuum of variation in consonance with the everyday meanings of masculinity and femininity. The masculine pole places emphasis on decision-making, action, and the initiation

of behavior. The feminine pole emphasizes conservation, nurturance, and the preservation of affect and experience. In previous studies of college students (1) scores on a slightly longer version of this scale³ correlated $-.48$ with peer ratings of masculinity among male Ss, and $+.38$ with peer ratings of femininity among female Ss. Cross-cultural analyses (1, 6) of the longer scale have also been encouraging. This slightly extended presentation of the femininity scale has been given because of the quite interesting finding that a positive relationship with sexual knowledge obtained for females, whereas for males the relationship was negative. That is, more feminine women, as feminine is intended by this scale, attained higher scores on sexual information test, whereas among males it was the more masculine, as defined by the scale, whose scores were higher on the sexual information questionnaire.

The final measure reported in Table 2 is Rotter's (7) Locus of Control Scale. Higher scores are indicative of externalized expectancies of reinforcement: i. e., a conviction that life is influenced by fate and external forces that are to some extent beyond the control of the individual. Lower scores are indicative of internalized expectancies: i. e., that one can initiate action and manage one's affairs in such a way as to attain desired goals or outcomes. Locus of control correlated negatively with sexual information for both sexes, as one would anticipate, but the coefficients were not significantly different from zero.

E. COMMENTS

The 24-item version of the Miller-Fisk Sexual Knowledge Questionnaire is short enough to be included as a 10-minute segment in testing batteries designed for studies of family planning, population psychology, and related issues. It covers essentially the same ground as the original 49-item version and has acceptable internal consistency for research work with college and adult samples. Additional analysis of the questionnaire will be necessary, of course, before its utility as an ancillary tool in population research can be considered established. One such need is in cross-cultural and transnational study. Techniques of assessment in the population domain must be applicable in different linguistic and cultural environments without loss of validity. Another need is to determine age change in the precollege years, and a third is to assess groups that may be expected to manifest different levels of sexual

³ A 38-item version of the femininity scale was used in this study of college students and also in the cross-cultural analyses [see Gough (1) and Levin and Karni (6)]. The Fy (femininity) scale in the Personal Values Abstract contains 34 of these 38 items; the four items dropped were those revealing reduced validity in cross-cultural inquiry.

knowledge. For these and other applications the 24-item scale may be recommended as a convenient and potentially valuable assessment device.

REFERENCES

1. GOUGH, H. G. A cross-cultural analysis of the CPI femininity scale. *J. Consult. Psychol.*, 1966, **30**, 136-141.
2. ———. Manual for the Personal Values Abstract. Palo Alto, Calif.: Consult. Psychol. Press, 1972.
3. ———. A factor analysis of contraceptive preferences. *J. of Psychol.*, 1973, **84**, 199-210.
4. ———. Personality assessment in the study of population. In J. T. Fawcett (Ed.), *Psychological Perspectives on Population*. New York: Basic Books, 1973. Pp. 329-353.
5. GOUGH, H. G., & SAMPSON, H. The College Vocabulary Test, Form A and Form B. Berkeley, Calif.: Inst. Personal. Assess. & Res., Univ. Calif., 1954.
6. LEVIN, J., & KARNI, E. S. A comparative study of the CPI femininity scale: Validation in Israel. *J. Cross-Cult. Psychol.*, 1971, **2**, 387-391.
7. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, **80**(1), Whole No. 609.

Institute of Personality Assessment and Research
University of California, Berkeley
2240 Piedmont Avenue
Berkeley, California 94720

THE DEVELOPMENT OF DIFFERENTIATION IN SELF-EVALUATIONS: A CROSS-CULTURAL STUDY*^{1, 2}

The University of Calgary

P. S. FRY

SUMMARY

Samples of preadolescents, adolescents, and young adults of middle-class backgrounds from Canadian and Asian-Indian populations were used to assess the hypothesis that with age, individuals reveal increasing differentiation in categories of personal characteristics, when evaluating themselves. The results of this cross-cultural study showed a linear increase in variance with age, in both cultural samples, and confirmed the findings of earlier investigations conducted exclusively with American-born subjects. Consistency of the findings of increasing differentiation in self-evaluations with age in the American, Canadian, and Asian samples suggests that such differentiation is a basic developmental factor in the organization of self-evaluations across cultures. In addition, it was found that, as compared with the Canadian sample, the Asian sample had significantly lower mean summation self-evaluation scores and lower mean variance scores at each age level. The implications of these cultural differences are discussed.

A. INTRODUCTION

Mullener and Laird (6) investigated developmental changes in the organization of self-evaluations. Using seventh- and twelfth-grade students and young adults as subjects, they assessed the hypothesis that, with age, individuals reveal an increasingly differentiated use of categories of personal

* Received in the Editorial Office on April 8, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The study was initiated while the author was on the staff of The United States Educational Foundation in India, Fulbright House, New Delhi, India, and was completed in subsequent visits to India. The author is grateful to several Fulbright Associates, both natives of India and foreign scholars, for their assistance in gathering data and in consultations and valuable insights they provided about the socialization patterns of the Asian-Indian children and adolescents. Graduate students from the Central Institute of Education, New Delhi, and visiting students from the East-West Center, University of Hawaii, were paid assistants in the study.

² Requests for reprints should be sent to the author at the address shown at the end of this article.

characteristics when evaluating themselves. Their hypothesis was consistent with the developmental model proposed by Werner and Kaplan [see Kaplan (3)], and it was assumed that with maturity the self-concept changes from being characteristically global to more differentiated and articulated (6, p. 233). The findings of these authors confirmed the results of earlier studies (e. g., 5, 9, 12) related to the capacity for differentiation in self-evaluations.

Inasmuch as Mullener and Laird (6) used a relatively small sample of middle-class American adolescents and adults, their study provided a rather limited test of the hypothesis of increasing differentiation with age. However, it is indeed a significant question as to whether cultural differences would produce different effects and trends in the organization of self-evaluations. Investigation of such developmental changes in self-evaluations has received little attention thus far.

Therefore, the present cross-cultural investigation was designed to provide information about (a) the relationship between developmental changes in the organization of self-evaluations and specific cultural influences and (b) the universality of the developmental changes in the organization of self-evaluation. The study compared a Canadian sample of preadolescents, adolescents, and young adults with an Asian-Indian sample of preadolescents, adolescents, and young adults.

An Asian-Indian population was selected, as, psychologically and culturally, it is relatively independent of the Western tradition (2). It represents sufficient contrast with the Canadian culture for investigators to appreciate the similarities and differences in the findings regarding developmental concepts. Both the North American and Asian cultures emphasize the central importance of the family, but in each of these societies, socialization occurs within the context of dissimilar cultural traditions leading to different organizations of person-perception and self-evaluations (7, pp. 223-231). Insofar as changes in impressions of others are analogous to changes in evaluation of self, then one would expect that different modes of person-perception and cognitive organization would lead individuals in another culture to perceive aspects of themselves in increasingly diverse ways; patterns of differentiation with increasing development would conceivably be different also.

This study is concerned with the application of a developmental notion, such as differentiation in self-evaluation. Thus, guided by earlier studies (4, 5, 6), Hypothesis 1 predicted a positive relationship between differentiation in self-evaluation and age level for both the Canadian and Asian-Indian sample. In other words, it was expected that with increasing age greater variance in self-ratings would be manifested. This position generates the view that there

is an ontogenetic sequence in the development of differentiations related to evaluation of the self; and the present investigation, in addition to replicating the hypothesis of earlier studies (namely, that the capacity to differentiate aspects of the self changes from global to specific with increasing age), focused on the comparative cross-cultural developmental process.

Hypothesis 2 predicted that at all age levels in the investigation, the Asian sample would indicate lower mean variance scores than the Canadian sample. This hypothesis was based upon the interpretations of Murphy and Murphy (7) who concluded that the ability for self-differentiation from the essential structures of family, clan, class, and state has not been reinforced, either historically or morally, in the Hindu-India culture.

Hypothesis 3 stated that at all three age levels of development, subjects in the Asian-Indian sample would obtain lower mean self-evaluation scores than subjects in the Canadian sample. The rationale underlying this predicted difference was based upon Murphy and Murphy's (7) observations of the uniformly pessimistic attitudes towards the self in the Asian psychology. The interpretation of these authors was that, with their extended family systems, the psychology of the Asian individuals is much less sharply differentiated, and patterns of individual self-disparagement and self-effacement are considerably more developed. Therefore, such tendencies would contribute to lower self-evaluation ratings.

B. METHOD

1. *Subjects*

Each cultural sample had 75 subjects selected from 100 volunteers: 25 preadolescents (11 to 12 years old), 25 adolescents (16 to 18 years old), and 25 young adults (25 to 30 years old).

In the Canadian sample, the preadolescents were mostly eighth grade subjects with a few that were repeating seventh grade; the adolescents were seniors in high school; and the young adults held full-time employment in the city or its vicinity and attended academic courses through the university's evening extension programs. All subjects were predominantly middle-class and resided within the metropolitan area of Calgary (a medium-size city in Alberta).

In the Asian-Indian sample, all subjects resided within the metropolitan area of New Delhi, India, and were predominantly middle-class. The preadolescents attended a private school and were mostly seventh grade students; the adolescents were college-preparatory students in high school; and the

young adults were all employed and attended evening classes in a private college.

Each group of subjects was divided evenly between males and females. Subjects were screened for age, level of education, socioeconomic standing, and intellectual status. Median age of preadolescents, adolescents, and young adults retained in the Canadian sample was 11.80, 17.25, and 26.5 years, respectively, and in the Asian-Indian sample, the average age was 12.0, 17.75, and 27.5 years, respectively. These age ranges were chosen so as to represent a cross-section of the youngest, intermediate, and mature groups capable of responding intelligently to the questionnaire.

Within each cultural setting, 24 volunteer subjects (eight within each of the three age ranges) were used in the pretesting of the questionnaire. In the Asian-Indian sample, 30 additional volunteer subjects were used in the pretesting of the translated version of the questionnaire.

2. Instruments

a. Questionnaire used for measuring self-evaluations. In the questionnaire designed to measure self-evaluations, subjects were required to evaluate themselves on 50 personality characteristics and skills which represented five major areas of personality having to do with intellectual skills, human relations skills, social responsibility, physical dexterity, and achievement. These five skill areas were established and defined in an *a priori* manner, and traits and characteristics considered most appropriate for self-evaluations were obtained from subjects in the pretesting.

Several steps were taken to insure that the instrument employed to measure self-evaluations would be as free as possible of cultural bias. Personality characteristics and traits for self-evaluations considered to be common to both cultural groups were used as the basis for constructing the questionnaire.

The general plan of investigation was to have the volunteer subjects in each cultural group list a minimum of 10 personality characteristics that would be relevant to the five content areas that had been constructed in an *a priori* manner. Given paper and pencil, the 24 volunteers in each cultural group (eight preadolescents, eight adolescents, eight young adults) were allowed five minutes to list 10 characteristics that they could think of that would adequately describe conceptions of the self and of the ideal person. Subjects were then asked to rank-order them on separate slips, first in terms of application of these characteristics of the self, and secondly in terms of application to their ideal person. The mean number of characteristics listed by the 24 subjects in the Canadian sample in the five minute period was

18.52 with a standard deviation of 4.42, and in the Asian sample the mean was 14.40 with a standard deviation of 5.40. Altogether about 300 different characteristics were listed. Commonness of response was arrived at by counting the number of occurrences of each characteristic among the 48 volunteer subjects (with some liberty taken in combining highly similar terms). To determine the relationship between commonness and order of occurrence, frequency counts were made for the first, the middle (or average of the two middle-most in cases of even numbers), and last characteristic in each list. The average of these counts was found to be 7.35 occurrences for the first characteristic, 4.80 for the middle, and 2.02 for the last. The difference between means for the first and last, and first and middle was significant at the .01 level. The analysis of the listings showed a significant tendency for more commonly occurring characteristics to appear earlier in the listings. This procedure for arriving at commonness of response in the two samples was adapted from Shipley, Aldrich, and Boyd (11). It yielded traits and characteristics that reflected a cross-section of the types of individual and social skills that an average individual in both cultures could be expected to use in evaluating himself.

From the broad sampling of two cultural groups, 65 characteristics were obtained that indicated high frequency of occurrence and that, according to interjudge ratings of three judges (98% agreement), measured distinctly different classes of personality characteristics. In 40 of the resulting characteristics, there was no question as to which of the five content areas (constructed and defined in an *a priori* manner) the item belonged. In the remaining 25 items, the majority vote of the three judges was taken to select 10 more items that could be grouped in the five content areas so as to finally yield 50 items: i. e., 10 items representing each of the five content areas:

An analysis of the number of traits and characteristics listed in each content area revealed that the relationship between the content areas remained approximately the same across the age ranges. The distribution showed that the five content areas selected for self-evaluations were basically stable categories.

The resulting 50 items were included in the questionnaire that became the measure of self-evaluations. In order to control for response bias, half of the items were stated in the positive and half in the negative, and each item was introduced on a six-point scale from "very true" to "very untrue." All items in the questionnaire had been pretested to insure that they could be understood by the youngest age group.

The questionnaire was administered in the English language form to the

Canadian sample. It was translated into Hindi—the native language of the Asian-Indian sample. In order to insure that no meanings of significance were lost in the translation, three professional colleagues who knew both languages well served as consultants. They described the versions as essentially the same. Also, the questionnaire in the Hindi language form was pre-tested on two groups of 15 Indian subjects (five preadolescents, five adolescents, five young adults) who were proficient in the use of both the Hindi and English language. One group of 15 subjects was administered the Hindi version first and the English version a week later. With the other group, the order of administration was reversed. Test-retest correlation coefficients for the scores of the two groups with a one week interval were .92 and .95, respectively.

b. Scale for assessing intellectual status of subjects. Since chronological age is not the most sensitive reflector of cognitive structures in the development stages (8, 14), mental age was used as an indicator of developmental level. Following Katz and Zigler (4) who found intellectual status to be related to differentiation of the self-concept, the investigators selected the Shipley-Hartford scale of functional intelligence to assess intellectual status of the subjects in the two cultural groups (1, 10). The scale is composed of two parts—a test of abstract thinking and a multiple choice vocabulary test—and the combined scores of both scales can be converted into a total mental age. The scale has many features that suggested its use in the present study as a quick screening test of mental ability: It (*a*) is easily administered to a group, (*b*) is readily scored, (*c*) requires a short time for administration, and (*d*) has a comparatively high ceiling. Above all other considerations, a quick observation of the contents of the abstract thinking and vocabulary subscales indicated that it could be translated closely and easily into Hindi and could be used therefore as a *very rough* measure of intelligence and intellectual status among subjects of both cultural groups.

Since it was recognized that the Shipley scale is not entirely culture free (and could not, therefore, be used to compare accurately the intellectual status of the Canadian and Asian subjects), the scale was used simply as a control variable to ensure that subjects at each developmental age level, within each cultural sample, were initially comparable in mean intellectual status. Thus, in the debriefing session, individual subjects were told that the scale for mental ability was not a high powered intelligence test and that no attempt was made to categorize or label subjects as being “dull” or “highly intelligent.” Such a procedure was deemed very necessary to eliminate any future threat by intelligence tests. In the Asian-Indian sample, a combination of

school records and the results of the broadly translated Shipley scale was used to determine intellectual status.

3. Procedure

The first step was to assess the intellectual status of the subjects within each cultural group and to insure that subjects at the three age levels had comparable intellectual status. The Shipley scale was administered to the subjects one week prior to the date set for the administration of the self-evaluation questionnaire. Three preadolescents from the Canadian sample and two adolescents from the Asian-Indian sample had to be dropped and replaced because they did not complete the Shipley scale according to instructions. The results revealed that the average mental age of the preadolescents, adolescents, and young adults in the Canadian sample was 15.00, 18.7, and 19.7, respectively, for which the corresponding chronological ages were 11.8, 17.25, and 26.5 years. For the corresponding Asian sample, the average mental ages were 14.0, 16.7, and 18.1, for which the matching chronological ages were 12.0, 17.75, and 27.5 years. Although group differences in mean mental age are apparent, there was sufficient evidence that, at the three age levels, mental ages showed a parallel developmental trend in the two cultural samples.

The one week interval between the administration of the Shipley scale and the self-evaluation questionnaire was planned in order to eliminate any association between performance on the intelligence test and self-evaluations. Assurance of complete confidentiality of results was given, and subjects were not required to reveal their names on either the scale or the questionnaire so as to promote frank responses.

In order to analyze the self-evaluation questionnaire, three types of scores were obtained: (a) An evaluation score was the total of the ratings for the 10 items in each content area. Thus, for each subject there were five evaluation scores representing five content areas. (b) A variance score represented the variance of the individual subject's evaluation scores across the five content areas. (c) A summation evaluation score represented the sum of the five evaluation scores across the five content areas. The scoring procedure was adapted from Mullener and Laird (6).

Since half the items in the questionnaire were positively toned, and the other half negatively toned, a "very true" response in the former grouping and a "very untrue" response in the latter grouping received an identical score of 6. This format for evaluating self-referent items was adapted from Katz and Zigler (4).

C. RESULTS

The analyses of the study were based on an examination of the five evaluation scores obtained for each subject. The mean size of the variance scores was taken to be the measure of differentiation. The analyses of these scores revealed a linear increase, with age. The means of the variance scores for the preadolescents, adolescents, and adults were 3.40, 4.52, and 5.32, respectively, for the Canadian sample, and .99, 2.62, and 3.82 for the corresponding age groups in the Asian-Indian sample. Therefore, the results for both cultural samples indicate that with growing age, subjects tended to show greater variance in self-ratings across content areas. The analyses of variance results showed $F = 6.82$, $df = 1$, $p < .01$ for linear increase in variance for the Canadian sample, and $F = 4.62$, $df = 1$, $p < .05$ for the Asian-Indian sample. These findings support the major hypothesis of increasingly differentiated self-evaluations, with age. Furthermore, the mean variance scores of the Asian subjects were significantly lower at each age level than the variance scores of the Canadian subjects. These differences are consistent with Hypothesis 2 of this study and suggest that self-evaluations were characteristically more global for the Asian sample when comparisons were made between the way children and adults in the two cultures organized and differentiated their self-evaluations.

As Table 1 shows, the summation evaluation scores for the Asian sample were significantly lower than the summation evaluation scores obtained by the Canadian sample at two out of the three age levels (i.e., preadolescence and adolescence). There was, however, no significant difference between the summation evaluation scores obtained by the adults in the two samples. These results partially support Hypothesis 3 which had predicted lower summation evaluation scores, at all age levels, for the Asian sample. No significant sex differences in summation scores were indicated within either cultural sample.

When the relationship between variance and evaluation scores was assessed

TABLE 1
MEAN SUMMATIONS AND STANDARD DEVIATIONS OF SELF-EVALUATION SCORES OF THE
CANADIAN AND ASIAN SAMPLES, CATEGORIZED BY SEX AND AGE LEVELS

Age levels	Males				Females			
	Canadian		Asian-Indian		Canadian		Asian-Indian	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Preadolescents**	180	7.52	102	6.95	170	8.42	86	8.92
Adolescents**	192	7.55	124	8.42	180	6.75	131	11.23
Adult*	195	5.25	182	6.82	194	7.75	172	11.75

* $p < .28$ for males; and $p < .25$ for females.

** $p < .001$ for both males and females.

sed, there was a definite association between the low variance score and high mean evaluation score ($F = 5.21$, $p < .05$) in the Canadian sample, and between the low variance score and low evaluation score ($F = 3.98$, $p < .05$) in the Asian sample. This finding, while not related to any of the hypotheses of the study, may possibly indicate a tendency among low differentiation individuals across cultures to use more primitive defenses; and, as suggested by Witkin *et al.* (13), such individuals tend generally to be unrealistically high, or unrealistically low, in evaluations of self.

D. DISCUSSION

As hypothesized, a definite association was found between maturity of age and increasing differentiation in self-evaluations. Thus, ratings of self-evaluations changed from being characteristically global to more differentiated. The linear increase in differentiation with age was upheld for both cultural samples, suggesting that the Canadian and Asian-Indian subjects demonstrated basic similarities in the developmental changes that take place in the organization of self-evaluations. The present cross-cultural research supports the results of previous studies done with American, white, middle-class subjects (4, 6) showing that with age there was a change from global to differentiated self-evaluations. Previous researchers concluded that this change is developmental and related to maturity and cognitive growth. The present study suggests that cultural differences do not greatly affect this linear increase in differentiation and that increasing differentiation may well be a basic factor of developmental change in self-evaluations associated with cognitive growth, in most cultures. As individuals in both cultural samples reached adulthood, they viewed themselves in an increasingly differentiated way. The interpretation that is proposed is that the development of differentiation in self-evaluations proceeds through a series of hierarchical stages closely related to cognitive development and culminates during adulthood.

Another observation of the study was that the summation evaluation scores of the Asian-Indian subjects were consistently lower than those of the Canadian subjects. This difference lends further support to the rationale presented in the Introduction regarding the uniformly pessimistic attitudes towards the self that were noted by Murphy and Murphy (7) in their observations of the Asian psychologies.

REFERENCES

1. GARFIELD, S. L. The Shipley-Hartford retreat scale as a quick measure of mental status. *J. Consult. Psychol.*, 1947, **11**, 148-150.

2. HSU, F. Clan, Class and Club: A Comparative Study of Chinese, Hindu, and American Ways of Life. Princeton, N.J.: Van Nostrand, 1963.
3. KAPLAN, B. Meditations on genesis. *Hum. Devel.*, 1967, 10, 67-87.
4. KATZ, P., & ZIGLER, E. Self-image disparity: A developmental approach. *J. Personal. & Soc. Psychol.*, 1967, 5, 186-195.
5. KOHN, A., & FIEDLER, F. Age and sex differences in the perception of persons. *Sociometry*, 1961, 24, 157-164.
6. MULLENER, N., & LAIRD, J. D. Some developmental changes in the organization of self-evaluations. *Devel. Psychol.*, 1971, 5, 233-236.
7. MURPHY, G., & MURPHY, L. B. Asian psychology. New York: Basic Books, 1968.
8. PIAGET, J. The Moral Judgment of the Child. London: Routledge & Kegan Paul, 1932.
9. ROSENBACH, D. Some factors affecting reconciliation of contradictory information in impression formation: An ontogenetic study in person perception. Unpublished Doctoral dissertation, Clark University, Worcester, Massachusetts, 1968.
10. SHIPLEY, W. C. A self-administering scale for measuring intellectual impairment and deterioration. *J. of Psychol.*, 1940, 9, 371-377.
11. SHIPLEY, W. C., ALDRICH, B., & BOYD, S. Some correlates of the order in which people think of personality traits when asked to list them. *J. Soc. Psychol.*, 1957, 45, 255-259.
12. SUPNICK, L. Source of information as a factor affecting impressions of others. Doctoral dissertation, Clark University, Worcester, Massachusetts, 1968.
13. WITKIN, H., DYK, R., FATERSON, H., GOODENOUGH, D., & KARP, S. Psychological Differentiation: Studies of Development. New York: Wiley, 1962.
14. ZIGLER, E. Metatheoretical issues in developmental psychology. In M. Marx (Ed.), - *Psychological Theory* (2nd ed.). New York: Macmillan, 1963. Pp. 341-369.

Department of Educational Psychology

The University of Calgary

Calgary, Alberta, Canada T2N 1N4

CHANGES IN ATTITUDES TOWARD PHYSICAL ACTIVITY AS A RESULT OF INDIVIDUALIZED EXERCISE PRESCRIPTION*

Department of Health and Physical Education, Texas A & M University

HOMER TOLSON AND JOHN M. CHEVRETTE

SUMMARY

College freshmen ($n = 193$) were subjected to a daily physical education and intramural program for six weeks. The physical education program centered around individualized prescription. Significant changes in attitude toward physical activity as assessed by the Kenyon Inventory for Determining Attitude Toward Physical Activity were obtained for four of the six scales of the instrument.

A. INTRODUCTION

There are a multitude of factors other than the approach to the program of physical education that may influence the student's attitude toward physical activity. Brumbach (2) found that certain situational actions on the part of the teachers, such as his or her participation with the student in the exercise, might well be a substantial cause for the change in attitude. Mista (7) investigating the attitudes of college women toward their high school physical education program found significant differences in attitudes among the letter winner and nonletter winners, among those students from farms and cities, among students from varying size high schools, and among many other factors relating to the student's previous experiences.

Alden (1) and Bullock and Alden (3) concluded in their studies in the area of attitude that such factors as the inconvenience of changing clothes, poor program planning, the physical education instructor, and the number of hours of physical education per week could affect the attitudes of students.

The purpose of the present study was to ascertain the effect of a daily program of exercise upon six scales for assessing attitude toward physical activity as a sociopsychological phenomenon.

* Received in the Editorial Office on April 12, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

B. METHOD

1. *Subjects*

The subjects were 193 college freshmen males enrolled at Texas A & M University. The subjects' ages ranged from 16 to 20 with a mean age of 17.8 years.

2. *Program*

A daily physical education period of one hour and 20 minutes duration was required of all subjects six days each week. Subjects were assigned at random into eight classes of approximately 25 students each. The program was administered by two instructors, each teaching four of the eight sections to which the subjects were assigned. The same procedures and teaching approaches were used in all sections of the program. Each student was required to participate in intramural activity one hour each day as a member of his group. The program was based on the capabilities and needs of each student as far as these could be assessed by the evaluative techniques available. An individual profile was developed for each student on the basis of selected tests. Basic parameters measured included height, weight, % body fat, total body strength, strength/pound of body weight, somatotype, cardiovascular fitness, reaction time, speed, and agility (4). Data on these variables were collected during the first and sixth weeks. After initial data profiles were scrutinized, ability groups were formed and exercise was prescribed on either an individual or a group basis. Each week the subjects devoted three days to the program prescribed, two days to skill learning, and one day to a lecture period centered around the basic concepts of physical education.

3. *Attitude Scales*

The Kenyon Inventory for Determining Attitude Toward Physical Activity was the measuring instrument used in the study (6). Form D for men was administered to all subjects during the first and sixth weeks. The six dimensions evaluated in the study were as follows: (a) social experience, (b) health and fitness, (c) pursuit of vertigo, (d) aesthetic experience, (e) catharsis, (f) ascetic experience. Test administrators emphasized that the best answer to each statement in the inventory was the student's personal opinion and that the response would have no effect on the student's final grade.

Validity of all scales used, except catharsis, has been developed (5). The validity of the catharsis scale has not been established, and further work in this dimension is needed. Hoyt's reliabilities for each of the six scales are as

follows (6): social experience, .72; health and fitness, .79; pursuit of vertigo, .89; aesthetic experience, .82; catharsis, .77; and ascetic experience, .81.

The scales were scored with use of *a priori* weights. Maximum score in each domain was 70 on the basis of 10 statements, except for the response to the "physical activity as catharsis" scale which had a maximum score of 63. Each scale was scored individually, and the results of the test were not cumulative. Pre and posttest scores were submitted to a paired observation *t* test to determine any significant differences. All tests were conducted with use of an alpha level of .01.

C. RESULTS

The results of the study are presented in Table 1. The program of exercise employed in the study elicited significant increases in four of the six scales of the Kenyon Attitude Inventory. Significant differences were found in the dimensions of catharsis ($t = 3.21$), ascetic ($t = 4.58$), vertigo ($t = 4.19$), and health and fitness ($t = 5.16$). No significant difference was observed on the dimensions of aesthetic ($t = -.46$) and social ($t = -.36$) experience.

D. DISCUSSION

An aspect of the program which could possibly account for improved performance and attitude was the fact that at the end of the first week each student's individual profile of pretest scores was presented to him in the form of a *T*-score bar graph. The meaning and interpretation of *T*-scores were explained to the students. The students were also informed that their programs would be prescribed on the basis of these charts. Since the profiles were marked with a heavy red line at the average *T* score of 50, a student could quickly observe those areas in which he was deficient. The realization that one has scored considerably below the rest of his peer group might provide ample incentive for improved performance and attitude.

TABLE 1
PRE AND POSTTEST MEANS AND *t* VALUES

Scale or dimension	Pre		Post		<i>t</i>
	Mean	SD	Mean	SD	
Catharsis	41.5	7.5	43.4	8.3	3.21*
Ascetic	41.4	8.8	42.9	9.7	4.58*
Vertigo	46.1	10.9	49.1	10.8	4.19*
Aesthetic	37.5	8.4	36.8	10.4	-.46
Health and fitness	43.4	7.8	46.9	8.4	5.16*
Social	45.2	6.6	45.1	6.9	-.36

* Significant at .01 level.

Another factor which according to Brumbach (2) may have enhanced the attitudes of the students was the fact that the instructors took part in all of the running and jogging parts of the program.

Since the subdomains of social and aesthetic experience were the least affected, one may wonder what some of the causes might be. Although little planned emphasis was placed on the aesthetic subdomain, it would appear that the attitude of the subject toward physical activity as a social experience would be affected positively. The planned intramural program, recreational opportunities offered, and the informal atmosphere of the physical education class all seem to point in that direction. It would appear that additional research, particularly directed to the use of the social experience scale of the Kenyon Inventory, or the use of a different scale, might provide some enlightening results.

E. CONCLUSIONS

The following conclusions appear to be in order within the limitations of the study:

1. Attitudes of college freshmen toward physical activity as a sociopsychological phenomenon can be affected in a relatively short period of time.
2. The attitudes of the subjects toward physical activity for health and fitness can change significantly as a result of planned programs.
3. The attitudes of the subjects toward physical activity as the pursuit of vertigo can be affected significantly.
4. The attitudes of college freshmen toward physical activity as catharsis can be improved as the result of a planned program.
5. Attitudes toward physical activity as an ascetic experience can be improved significantly.
6. Attitudes in the aesthetic and the social subdomains of physical activity do not appear to be as susceptible to change by an individual prescription program of the nature presented in this study.

REFERENCES

1. ALDEN, M. A. The factors in the required education program that are least attractive to the college girl. *Res. Quart.*, 1932, **3**, 97-107.
2. BRUMBACH, W. B. Effects of a special conditioning class upon students' attitudes toward physical education. *Res. Quart.*, 1968, **39**, 211-213.
3. BULLOCK, M., & ALDEN, F. Some factors determining the attitudes of freshman women at the University of Oregon toward required physical education. *Res. Quart.*, 1933, **4**, 60-70.
4. CHEVRETTE, J. M., & TOLSON, H. Individual prescription. *J. Health, Physical Educ. & Recreat.*, 1970, **41**, 38-39.

5. KENYON, G. S. A multidimensional scaling approach to validating an *a priori* model for characterizing values held for physical activity. Paper presented at The American Association for Health, Physical Education and Recreation Convention, Dallas, Texas, 1965.
6. ———. A conceptual model for characterizing physical activity. *Res. Quart.*, 1968, **39**, 96-105.
7. MISTA, N. J. Attitudes of college women toward their high school physical education programs. *Res. Quart.*, 1968, **39**, 166-174.

Department of Health and Physical Education
Texas A & M University
College Station, Texas 77843

MANIFEST HOSTILITY AS MODIFIED BY THE K AND SO-R SCALES OF THE MMPI*

Ohio University

JON VANDEVENTER AND JAMES T. WEBB

SUMMARY

An examination of the relationship of scores on Siegel's Manifest Hostility Scale (MHS) to Verbal Hostility, Fantasy Hostility, and Hostile Feeling responses to cartoon situations was undertaken, while controlling for sex of subject, sex of experimenter, and the social desirability (*So-R*) and ego strength/defensiveness (*K*) scales of the MMPI. MHS scores were significantly related to the three modes of hostility response, while sex of subject and sex of experimenter were not. Adjustment of the dependent variable means for *So-R* did not cancel MHS effects on Verbal or Fantasy Hostility, but adjustment for *K* cancelled the significant relationship between MHS scores and Fantasy Hostility and Hostile Feeling responses. Covariation of both *K* and *So-R* out of Verbal Hostility cancelled its relationship to MHS scores. Ego strength/defensiveness thus may be more significantly related to hostile responding than social desirability.

A. INTRODUCTION

Using Siegel's (6) Manifest Hostility Scale (MHS), VanDeventer (7) found no relation between MHS scores and subjects' Verbal Hostility, Fantasy Hostility, or self-rated Hostile Feeling responses to cartoons from the Rosenzweig Picture-Frustration Study (4). *Post hoc* speculation suggested possible confounding due to sex of the *S*, sex of the experimenter, and possible hostility control factors of social desirability, ego strength, and defensiveness. The present article reports findings from a larger, subsequent extension of the VanDeventer study, which are relevant to the properties of the *So-R* (2, 3) and *K* scales of the Minnesota Multiphasic Personality Inventory (MMPI).

B. METHOD

Thirty-six *Ss* of each sex were selected from 442 American undergraduates on the following basis. Separate distributions of MHS scores were derived for

* Received in the Editorial Office on April 19, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

each sex. On the basis of Z -scores, the S s then were randomly selected from the upper 25%, the lower 25%, and the middle third of the cases of their respective sex distributions, creating three equal N groups of males and females. Each S additionally completed two MMPI scales: $So-R$ to measure social desirability, and K to measure ego strength/defensiveness.

The experimental treatments and the scoring of the dependent variables are described elsewhere (7). Differences between the present investigation and the previous one include the use of E s and S s of both sexes, the administration of the K and $So-R$ scales along with the MHS scale, and the use of two female undergraduate raters. Three basic dependent variables were used: (a) Verbal Hostility responses, (b) Fantasy Hostility responses, and (c) the adjectives "angry" and "annoyed" in determining Hostile Feeling responses.

C. RESULTS AND DISCUSSION

The interjudge reliability (Pearson's r) was .82 ($df = 71$; $p < .001$) for Verbal Hostility responses, and .94 ($df = 71$; $p < .001$) for Fantasy Hostility responses, confirming the reliability of these dependent variable measures.

MHS level was significantly related ($F = 10.09$; $df = 2, 48$; $p < .005$) to ratings of Verbal and Fantasy Hostility (treated as a within S s factor). Adjective self-report of Hostile Feeling also was related to MHS level ($F = 4.98$; $df = 2, 48$; $p < .05$). The dependent variables were not related to sex of S or sex of E . In contrast to the previous study (7), scores on the MHS scale thus appear to be related to S s' Verbal and Fantasy Hostility responses, and to their Hostile Feeling responses as well. A Multivariate analysis of variance (1) revealed that MHS level differed significantly across the five dependent variables (K , $So-R$, Verbal Hostility, Fantasy Hostility, and Hostile Feeling) when no covariation of dependent variables was employed. K and $So-R$ levels were subsequently treated as dependent variables, and thus controlled by covarying them out of the other dependent variables. Adjustment of dependent variable means for K (either alone or in any combination with other dependent variables) generally resulted in nonsignificant relations of the remaining dependent variables to MHS level. The one exception was a significant relation of MHS to Verbal Hostility when K alone was covaried out.

The significance of the relation of K with MHS level likewise was not cancelled out by covariation of any combination of the other dependent variables. In the analysis, as MHS level increased, K scores decreased. Fantasy Hostility and Hostile Feeling responses thus apparently are dependent upon

Ss' ability to put up a good front and upon their defensiveness, while Verbal Hostility is not so clearly influenced.

The results from adjusting means for *So-R* were less clear. Covariation of *So-R* (alone or in combination with other dependent variables) did not remove the significant relation between MHS and *K*, nor did covariation of *So-R* alone erase the significant relation of Verbal Hostility or Fantasy Hostility to MHS level. Adjustment of means for *So-R*, in combination with other dependent variables (with *K* excluded), removed the significant relation of MHS scores to the remaining dependent variables, with the exception that Verbal Hostility retained its significant relation to MHS when cell means were adjusted for *So-R* and Hostile Feeling. Thus, when *K* was not excluded, MHS level increased as *So-R* decreased.

With use of only *K* and *So-R* as dependent variables, a stepping down procedure (5). indicated that *K* (rather than *So-R*) contained the dependent variable variance which was significantly related to MHS level. Surprisingly, then, social desirability (*So-R*) does not appear to contribute significantly to MHS level effects on the production of Verbal Hostility or Fantasy Hostility responses; rather, *K* alone accounts for such effects with Fantasy Hostility and Hostile Feeling, while *K* in combination with *So-R* (or any other dependent variable) accounts for the MHS main effects on Verbal Hostility. Ego strength/defensiveness thus may be a more significant personality variable relative to the production of hostile responses than social desirability.

REFERENCES

1. BOCK, R. D. Contributions of multivariate experimental designs to educational research. In R. B. Cattell (Ed.), *Handbook of Multivariate Experimental Psychology*. Chicago: Rand McNally, 1966. Pp. 820-840.
2. EDWARDS, A. L. The relationship between the judged desirability of a trait and the probability that the trait will be endorsed. *J. Appl. Psychol.*, 1953, **37**, 90-93.
3. ———. The Social Desirability Variable in Personality Assessment and Research. New York: Dryden, 1957.
4. ROSENZWEIG, S. Rosenzweig Picture-Frustration Study. In A. Weider (Ed), *Contributions Toward Medical Psychology* (Vol. 2). New York: Ronald Press, 1953.
5. ROY, S. N., & BARGMANN, R. E. Tests of multiple independence and the associated confidence bounds. *Ann. Math. Stat.*, 1958, **29**, 491-503.
6. SIEGEL, S. M. The relationship of hostility to authoritarianism. *J. Abn. & Soc. Psychol.*, 1956, **52**, 368-373.
7. VANDEVENTER, J. N. Validation of a scale to measure trait versus state hostility. Unpublished Master's thesis, Ohio University, Athens, Ohio, 1972.

Department of Psychology
Ohio University
Athens, Ohio 45701

A RATIONAL APPROACH TO DEVELOPING AND ASSESSING THE CONSTRUCT VALIDITY OF A STUDENT LEARNING STYLE SCALES INSTRUMENT* 1, 2

University of Cincinnati

SHERYL WETTER RIECHMANN AND ANTHONY F. GRASHA³

SUMMARY

An instrument, the Grasha-Riechmann Student Learning Style Scales (GRSLSS), was developed to assess six student learning styles. These styles are Independent, Dependent, Avoidant, Participant, Collaborative, and Competitive. A "rational approach" was used to develop the GRSLSS and evaluate its construct validity. The process included professional and student inputs in special procedures for selecting scale items and designing criterion items. The utility of this approach is considered and problems critiqued. The rational approach yielded relatively high temporal reliability coefficients (range across scales $r = .76$ to $r = .83$; $N = 269$) and numerous meaningful correlations between criterion items and scale scores.

A. INTRODUCTION

The potential contribution of considering individual student characteristics for understanding and enhancing classroom learning is suggested by several studies (cf. 1, 3, 8, 9). In much of this literature, standardized personality tests have been used to identify student characteristics. A typical finding, however, is that such tests do not serve as reliable predictors of classroom performance (11, 12), nor as adequate indications of which characteristics interact with instructional formats (3) or academic achievement (2). If teachers are to innovate and take student learning needs into consideration,

* Received in the Editorial Office on April 22, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This study is based in part on a Masters thesis done by the senior author in the Department of Psychology, University of Cincinnati. Thanks are extended to Dr. Richard Melton for his statistical and design assistance.

² The assistance of the Behavioral Science Laboratory of the University of Cincinnati with the computer analysis of the data is acknowledged.

³ Requests for reprints and revised copies of the GRSLSS (15 items/scale) should be sent to Dr. Anthony F. Grasha at the address shown at the end of this article.

relatively easy to use and interpret methods of assessing students' learning styles are needed.

To accomplish this goal a decision was made to develop an instrument that was based on the types of learning styles students demonstrate in the classroom. On the basis of interview and questionnaire data obtained from students (cf. 4, 5) six general styles were distinguished. They were the Independent, Dependent, Participant, Avoidant, Collaborative, and Competitive learning styles. Each of the six response styles was defined around three classroom dimensions; student attitudes toward learning, view of teachers and/or peers, and reactions to classroom procedures. The definitions of the six learning styles are given in the Appendix.

To deal with the issues of selecting items for the instrument and then assessing the validity of the constructs underlying the instrument, a rational approach to scale construction was employed (6). This approach emphasizes the importance of theory, of rationally defining constructs, and of devising items in relation to one's theory. Judges essentially write items that they feel rationally relate to the theory and constructs being considered. This is in contrast to the method of empirical item selection (7) where a large pool of items is devised without strong reference to a theory or definition of the constructs underlying the instrument. Jackson's method is more efficient in terms of time and energy spent in item selection. His success in developing the Personality Research Form suggests that the procedure can lead to an instrument that has acceptable levels of reliability and validity.

The present paper outlines the "rational" process that was used to begin the development of the Grasha-Riechmann Student Learning Style Scales (GRSLSS). The major focus of this article is to present the procedures used and the assumptions made in the initial stages of developing the instrument. They are unique and should be of value to others interested in designing classroom related instruments. *Our intent is not to present the instrument as a final product here.* The rational procedures employed were useful in obtaining an initial version of the scales and in suggesting several directions for the future modification and development of the scales. It is *this process and its utility* that is of major concern in this paper.

B. SELECTION OF ITEMS FOR THE GRSLSS

Each of 34 undergraduate college students, 21 females and 13 males, were asked to pick 48 items from an 84 item pool. The 84 items had been designed by *E* to tap the dimensions in each of the six scale definitions. This was done in such a way to yield 14 items for each of the six scales. Students were used

to select the best items from this pool for use in the instrument, since they were deemed to be the best judges of student classroom behaviors and preferences. Support for the use of students as item judges in another context is provided in a study by Stricker, Jacobs, and Kogan (10).

Students were told that they were helping to design a student learning style questionnaire. The concept of learning styles was briefly explained, and each *S* was given the definitions of each scale on separate 3×5 cards. Participants were told to imagine a person who exhibited the characteristics given in each definition. Each student was given a deck of index cards containing the 84 items. They were instructed to sort the cards into the six learning style categories with the restriction that they finish with 14 cards in each category. Students were told that the items sorted most consistently into a given category would be used in the final instrument.

The criterion for inclusion of an item in the scales was set at 70% agreement among *Ss*. With the use of this criterion, it was possible to obtain eight items for each of the scales except the Participant scale. The criterion was lowered to 59% to obtain eight items for that scale. Of the 48 items selected for the GRSLSS, 28 were consistently sorted into a category 80% of the time, and 14 of these items were sorted more than 90% of the time into a given category.

C. COLLECTION OF CONSTRUCT VALIDITY DATA

Collecting construct validity data on the GRSLSS presented a problem. A crucial part of that problem was to decide what constituted an appropriate criterion measure. Contrary to most construct validity studies, there seemed to be no obviously related, pretested criterion measure available. Different personality tests were considered, but were dismissed as inappropriate for several reasons. First, they generally seemed not to assess behaviors directly associated with the classroom. Since teachers are not familiar with interpreting personality test results, possible correlations between personality tests and the GRSLSS were not perceived to be helpful. More importantly, however, the hypothesized constructs underlying most of the learning styles (Independent, Dependent, Avoidant, Participant, Collaborative, Competitive) were not easily related to traditional personality variables.

1. *Development of Criterion Item Questionnaire*

In view of the above considerations, it seemed reasonable that a measure of classroom behavior would be the best criterion. The procedure of actually observing classroom behavior was eliminated as a possibility because of the

time, number of dimensions, expense, and difficulty of interpretation involved. Rather, a criterion instrument designed to assess classroom behaviors and preferences and to relate to the learning style constructs seemed more appropriate. To our knowledge, no such instrument existed and one had to be developed. This decision presented three issues: What behaviors should be included in such an instrument? How should the criterion items be derived? Who should judge the appropriateness of the criterion items? Our solutions to these questions are presented below.

In Phase 1 of the construct validity portion of the study, 21 undergraduate student volunteers worked in *small groups* of up to four members to suggest criterion items. Each *S* was given a set of six cards with the definition of a scale typed on each one. On the basis of these definitions, *Ss* were asked to predict specific classroom behaviors and preferences that students with *each of the styles* would exhibit. The predictions asked for were of three types: (a) Classroom related behaviors the student would exhibit (e.g., a student scoring highly on the Avoidant scale might skip a lot of classes); (b) The kind of teaching techniques the student would prefer (e.g., the Collaborative student might prefer group discussions); (c) The kind of tests and/or assignments the student would prefer (e.g., the Independent student might wish to choose class readings for himself). Subjects were asked to make their predictions orally. In this way *E* was able to assess the level of agreement among the *Ss* in each small group on the suggestions made.

In Phase 2, *E* wrote 71 items from the approximately 575 suggestions generated by the small groups. Items were written to reflect those behaviors and preferences consistently suggested to be appropriate for each style by several different *Ss*. The selected items were of two types. The first type were called *uni-scale items*. On the basis of students' suggestions in Phase 1, these items were predicted to correlate primarily with only one scale. The *uni-scale items* referred most often to classroom related behaviors. Examples of *uni-scale items* are the following: I daydream during classes (Avoidant); I sit straight and pay attention to what goes on in class (Participant). The second type were called *multiple-scale items*. On the basis of students' suggestions, these items were predicted to correlate with more than one scale. Examples of these items are as follows: I talk with other students outside class about what was covered in class (Collaborative and Participant); Small seminar classes preferred (Independent and Collaborative). Of the 71 items in the Criterion Item Questionnaire, 51 items were *uni-scale* and 21 were of the *multi-scale* variety.

In Phase 3, 264 sophomore psychology students responded to both the GRSLS and the Criterion Item Questionnaire. The correlations of the scales with the criterion items provided some evidence of the construct validity of the learning style scales. Predicted correlations were significant most often for the Avoidant (86%), Collaborative (67%), and Participant (60%) scales, and less often for the Dependent (50%), Independent (47%), and Competitive (23%) scales. There was a tendency for the scales with lower percentages of significant predicted correlations to have fewer criterion items originally expected to correlate with them. For example, the Competitive and Dependent scales had the fewest predicted correlations (13 and 14, respectively), whereas the Avoidant and Collaborative scales had the most (22 and 18, respectively).

For all scales, predicted correlations were more often significant for criterion items describing classroom behavior than were predicted correlations for the criterion items concerning type of assignment, tests, and teaching methods preferred. When one looks, however, at the criterion items that did correlate significantly with the scales, it is clear that those items are consistent with the characteristics listed in the constructs underlying each scale. Because of the large number of significant correlations between criterion items and scale scores, all the relevant correlations cannot be discussed in this paper. Only a few of the statistically significant correlations for each scale will be considered. All correlation coefficients discussed in this paper were significant at the .01 level of confidence.

2. *Avoidant Scale Correlations*

With regard to the Avoidant scale, the Avoidant student was defined as not interested in learning course content in the traditional classroom, as not participating much in classroom activities, and as overwhelmed or uninterested in what occurs in the classroom. Scores on the Avoidant scale do correlate with a number of pertinent criterion items. The following items are examples.

I doodle in my notebooks ($r = .34$).

I daydream during class ($r = .45$).

I never ask questions in my classes ($r = .29$).

During class I talk and joke around with the people sitting next to me ($r = .28$).

The classroom behavior items with which the scale correlated negatively are also suggestive of the Avoidant student. For example:

- I sit straight and pay attention to what goes on in class ($r = -.40$).
- I keep up on class reading assignments ($r = -.30$).
- I listen carefully to what others in the class say ($r = -.22$).
- I reread assignments at least twice ($r = -.24$).

All of these items suggest that students scoring highly on the Avoidant scale tend not to be prepared for class or to pay attention when they get to class.

Some of the statistically significant correlations between the Avoidant scale and criterion items relating to the type of assignments and test liked follow:

- No tests ($r = .30$).
- Blanket grades where everybody in class automatically gets a passing grade ($r = .24$).
- No required readings or assignments ($r = .31$).
- Term papers and projects to be done individually where topic is determined by the student ($r = -.22$).

These items suggest that the Avoidant student is one who does not like to be evaluated or to do assignments. He dislikes writing papers when he has to choose the topic, perhaps indicating that he does not like to take responsibility for class assignments.

All of these data taken together fit with the predetermined definition of the Avoidant scale. These data would also seem to suggest that the Avoidant student would be likely to get low grades. The correlation between the Avoidant scale and grade point average was found to be $-.34$.

3. *Participant Scale Correlations*

A large number of the predicted correlations for the Participant scale were also found to be statistically significant. The Participant student was defined as one who wants to learn course content, likes to go to class, and takes responsibility for getting the most out of classes. The definition suggests that this type of student would function effectively in the classroom environment. This hypothesis is supported by the positive correlation ($r = .23$) between this scale and grade point average and also by the correlations between the scale and the criterion items.

Examples of the correlations between the Participant scale and items relating to classroom related behaviors are the following:

- I sit toward the front of the room ($r = .33$).
- I keep up on class reading assignments ($r = .40$).
- I sit straight and pay attention to what goes on in class ($r = .42$).
- With the exception of being sick, I never cut class ($r = .35$).

One gets a totally different picture from these items than from the items with which the Avoidant scale correlated. This negative relationship between the Participant and Avoidant scales is illustrated most cogently in their correlations with certain of the criterion items. In several cases, criterion items which correlated positively with one scale correlated negatively with the other. For example, the item, "I daydream during classes," correlated .45 with the Avoidant scale and $-.38$ with the Participant scale. The reverse was true for the item, "I sit straight and pay attention to what goes on in class." It correlated $-.40$ with the Avoidant scale and .42 with the Participant scale. Correlations of this type are specific evidence of the negative correlation between these scales suggested by the negative interscale correlation ($r = -.62$).

The Participant scale positively correlated with 15 criterion items with which it was not predicted to correlate. (The Avoidant scale, in contrast, only correlated with two criterion items with which it was not predicted to correlate.) This outcome for the Participant scale is consistent with the finding that the Participant scale correlated somewhat with every other scale. The findings are also consistent with the Phase 1 student opinions. These students said the Participant student was unlikely to have strong preferences about classroom activities.

4. Collaborative Scale Correlations

The Collaborative scale correlated with 67% of the items with which it was predicted to correlate. (The Avoidant scale correlated with 86% and the Participant with 60%.) The Collaborative style emphasizes sharing ideas with faculty and students and working in groups. Because the emphasis is on interpersonal behavior rather than on behaviors related directly to content learning, no significant correlation between the scale scores and grade point average was expected. None was found.

The emphasis of this scale on Collaborative behavior is vividly illustrated by the following criterion items with which the scale correlated:

I listen carefully to what others in class say ($r = .28$).

I share ideas from my outside reading with other students in classes ($r = .36$).

Group or peer-determined grades ($r = .22$).

Doing group projects rather than doing individual projects ($r = .23$).

The Collaborative scale correlated with more of the teaching method items in the Criterion Item Questionnaire than did the other scales. Correlations with the following four of these items were predicted to be significant:

- Lecture with class discussion ($r = .25$).
- Lecture with small group discussion ($r = .36$).
- Student designed courses ($r = .31$).
- Prefers small seminar classes ($r = .28$).

As might be expected on the basis of these items, the Collaborative scale correlated $-.26$ with the item, "Lecture with syllabus and no discussion." Overall, the data for the Collaborative scale do suggest, as does the definition of the style, that a student scoring highly on the scale likes to share ideas and work with others.

5. *Remaining Correlations*

The validity evidence on the Dependent, Competitive, and Independent scales was not as strong as it was for the Avoidant, Participant, and Collaborative scales. Predicted correlations were significant 50% of the time for the Dependent scale, 47% of the time for the Independent scale, and 23% of the time for the Competitive scale.

For the Dependent scale, certain of the significant correlations found were consistent with the definition of the Dependent student as one who learns only what is required and who looks to others for guidance and support. For example:

When students participate in class decisions, I agree with the majority ($r = .13$).

I find teacher outlines or notes on the board helpful ($r = .27$).

I request that deadlines be set for when assignments are due ($r = .18$).

The Independent scale also correlated significantly with items that were consistent with the definition given for Independent students. Such a student was thought to like to think for himself, to prefer working alone, and to learn what he felt was important. Examples of items follow:

I try to abstract concepts out of the facts I hear ($r = .27$).

If I don't understand something, I try to figure it out for myself before I go to someone else for help ($r = .21$).

Prefers small seminar classes ($r = .22$).

The findings were similar for the Competitive scale. The Competitive student was defined basically as one who learns course content in order to perform better than others in class, and who feels he must compete with other students for teachers' attention and grades. Examples of significant predicted items which are consistent with this definition are the following:

I ask other students in my classes what grades they received on tests and/or assignments ($r = .28$).

I ask more questions than most of the other students do in my classes ($r = .18$).

D. CONCLUSION

The large number of meaningful significant correlations found between criterion items and scale scores indicate that the rational approach to scale construction was useful in this context. Undergraduate students were able to suggest relevant scale items and criterion items. The magnitude of effectiveness of this approach was masked by the relatively low temporal reliability of the GRSLS. In the initial study, the test-retest reliability coefficients ($N = 93$) ranged from .64 for the Independent and Competitive scales to .78 for the Participant scale and .79 for the Avoidant scale. Significant male—female differences were not noted.

On the basis of the data from this study, the number of items per scale was increased in a later study from eight to 15. The test-retest reliabilities (seven-day interval between testings) on this expanded instrument increased over those on the eight item instrument. The new reliability coefficients for males ($N = 119$) are as follows: Independent, .84; Avoidant, .82; Collaborative, .81; Dependent, .81; Competitive, .84; Participant, .89. The reliability of the scales was slightly lower for females. Coefficients for females ($N = 150$) are the following: Independent, .82; Avoidant, .76; Collaborative, .78; Dependent, .73; Competitive, .81; Participant, .74. Total sample coefficients ($N = 269$) were Independent, .83; Avoidant, .79; Collaborative, .80; Dependent, .76; Competitive, .82; Participant, .82. Studies are underway to assess whether the expected increase in validity coefficients will occur as a result of the increase in temporal reliability coefficients.

APPENDIX: DEFINITIONS OF THE SIX LEARNING STYLES USED IN PART I AND PART II

1. *Independent*. This response style is characteristic of the student who likes to think for himself. He prefers to work on his own, but he will listen to the ideas of others in the classroom. He learns the content he feels is important and is confident in his learning abilities.
2. *Dependent*. This style is characteristic of the student who shows little intellectual curiosity and who learns only what is required. He sees teachers and peers as sources of structure and support. He looks to authority figures for guidelines and wants to be told what to do.
3. *Collaborative*. This style is typical of the student who feels he can learn the most by sharing his ideas and talents. He cooperates with teachers

and peers and likes to work with others. He sees the classroom as a place for social interaction, as well as content learning.

4. *Competitive*. This response style is exhibited by the student who learns material in order to perform better than others in the class. He feels he must compete with other students in the class for the rewards of the classroom, such as grades or teachers' attention. He views the classroom as a win-lose situation where he must always win.

5. *Participant*. This style is characteristic of the student who wants to learn course content and likes to go to class. He takes responsibility for getting the most out of class and participates with others when told to do so. He feels that he should take part in as much of the class related activity as possible and does little that is not part of the course outline.

6. *Avoidant*. This response style is typical of a student who is not interested in learning course content in the traditional classroom. He does not participate with students and teachers in the classroom. He is uninterested or overwhelmed by what goes on in the classes.

REFERENCES

1. DOWALIBY, F. J., & SCHUMER, H. Teacher-centered vs. student-centered mode of college classroom instruction as related to manifest anxiety. Paper presented at the American Psychological Association, Washington, D. C., September, 1971.
2. ENTWISTLE, N. J., & ENTWISTLE, D. The relationship between personality, study methods, and academic performance. *Brit. J. Educ. Psychol.*, 1970, **40**, 132-141.
3. GOLDBERG, L. Student personality characteristics and optimal college learning conditions. Monograph No. 9, Oregon Research Institute, University of Oregon, Eugene, 1969.
4. GRASHA, A. F. Emphasizing the negative: Avoidance, competitive and dependent response styles; implications for classroom design. *Cat. of Select. Doc. in Psychol.*, 1971, **1**, 19-20.
5. ———. Observations on relating teaching goals to student response styles and classroom methods. *Amer. Psychol.*, 1972, **27**, 144-147.
6. JACKSON, D. N. The dynamics of structured personality tests: 1971. *Psychol. Rev.*, 1971, **78**, 229-248.
7. MEEHL, P. E. The dynamics of "structured" personality tests. *J. Clin. Psychol.*, 1945, **1**, 296-303.
8. POHL, R. L., & PERVIN, L. A. Academic performance as a function of task requirements and cognitive style. *Psychol. Rep.*, 1968, **22**, 1017-1020.
9. RAYNOR, J. O. Relationships between achievement-related motive, future orientation, and academic performance. *J. Personal. & Soc. Psychol.*, 1970, **15**, 28-33.
10. STRICKER, L. J., JACOBS, P., & KOGAN, N. Veridicality of implicit personality theories. *Proc. Seventy-Eighth Ann. Conven. Amer. Psychol. Assoc.*, 1970, **5**, 157-158 (Summary).
11. TALLMADGE, G. K., & SHEARER, J. W. Relationships among learning styles, instructional methods, and the nature of learning experiences. *J. Educ. Psychol.*, 1969, **60**, 220-230.

12. ———. Interactive relationships among learning characteristics, types of learning, instructional methods, and subject matter variables. *J. Educ. Psychol.*, 1971, **62**, 31-38.

*Institute for Research and Training in
Higher Education/Department of Psychology
University of Cincinnati
Cincinnati, Ohio 45221*

SELF-ACTUALIZATION AND WOMEN'S ATTITUDES TOWARD THEIR ROLES IN CONTEMPORARY SOCIETY*

State University of New York, College at Brockport

LARRY A. HJELLE¹ AND RHONDA BUTTERFIELD

SUMMARY

Differences in degree of self-actualization were examined in relation to attitudes toward women's rights and roles in society. Two groups of college-aged females, 20 liberal and 20 conservative, preselected on the basis of their scores on the Spence and Helmreich Attitudes Toward Women Scale, were compared in terms of measures relating to Shostrom's Personal Orientation Inventory (POI), a diagnostic instrument designed to assess values and self-percepts associated with self-actualization. The results indicated substantial support for the prediction that women professing liberal, profeminist attitudes are more self-actualized than women endorsing traditional social role attitudes. Ten of the 12 POI scales yielded statistically significant mean group differences. Suggestions for further research were offered.

A. INTRODUCTION

Since the middle sixties behavioral scientists have shown a marked upsurge of interest in the psychosocial study of women. To a considerable extent such interest has been fostered by the women's liberation movement and numerous books (e. g., 3, 5, 6) decrying women as second-class citizens who encounter dehumanization and discrimination in virtually every phase of their lives. The *Journal of Social Issues* recently devoted an entire issue to the topic of "new perspectives on women," providing an excellent survey of much of the literature concerning the changing educational, vocational, and sexual roles of the contemporary woman (1972, Volume 28). Despite the proliferation of speculative essays and empirical studies, however, investigations of young women's attitudes toward their multiple roles in society and their psychological well-being are practically nonexistent. Thus, it would

* Received in the Editorial Office on April 22, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Requests for reprints should be sent to the first author at the address shown at the end of this article.

seem important to determine not only whether most women accept or reject traditional feminine roles and behaviors, but also to examine the extent to which indices of psychological health accompany the traditional or more liberated view.

The purpose of this study was to compare extreme liberal and extreme conservative women's attitudes toward their roles and rights in society to Shostrom's (7) measure of self-actualization. The construct of self-actualization was selected as a focus for investigation because of the central role it occupies in the women's liberation struggle for personal and social development. Insofar as one of the major goals of the women's liberation movement is to achieve a greater degree of self-fulfillment by actualizing their own potentialities, the following prediction was made: Women expressing liberal attitudes (i. e., profeminist) toward their role orientations would score significantly higher on Shostrom's self-actualization scales than would women endorsing conservative attitudes.

B. METHOD

1. *Subjects*

The subjects were 98 female students enrolled in an introductory psychology course at a state university who participated in this study to satisfy a class requirement. All were single, full-time students who were between 17 and 20 years of age.

2. *Instruments*

Three test instruments were used. First, the Attitudes Toward Women Scale, constructed by Spence and Helmreich (8), consists of 55 Likert-format statements bearing on the vocational, educational, and intellectual roles of women; freedom and independence; dating, courtship, and etiquette; sexual behavior; and marital relationships and obligations. The purpose of this scale is to distinguish between women who possess conventional, conservative attitudes and women who possess liberal, profeminist attitudes toward their roles in society. Each item is assigned a score from 0 to 3, so that each subject's score is obtained by summing the values for the individual items, with possible scores ranging from 0 to 165. High scores are indicative of liberal attitudes, and low scores are indicative of conservative attitudes. Spence and Helmreich (8) report a mean score of 98.21 based on a normative sample of 768 undergraduate women. Items from the scale include the following: "Both husband and wife should be allowed the same grounds for

divorce," "Sons in a family should be given more encouragement to go to college than daughters," and "The intellectual leadership of a community should be largely in the hands of men."

The Personal Orientation Inventory (POI), developed by Shostrom (7), consists of 150 two-choice comparative value statements which purport to assess particular personality characteristics associated with self-actualization. The inventory is scored in terms of two major scales of "personal orientation": Inner Directed and Time Competent. In addition, 10 subscales are scored, each of which is considered to be instrumental to the psychological construct of self-actualization. High scores on each of the respective scales indicate a greater presence of self-actualization attribute in question. Research findings suggest that Shostrom's inventory is a reasonably valid and reliable measure of self-actualization (2, 4).

Subjects also completed the 33-item Marlowe-Crowne Social Desirability Scale (1) to determine if response set might confound possible group differences on either of the other two instruments.

3. Procedure and Data Analysis

Subjects were administered the instruments in a single testing session which concluded with the female examiner giving a brief explanation of the purpose of the study and answering any questions. Testing was anonymous, and subjects were assured that the data would be treated confidentially. The Attitudes Toward Women Scale was given first, and then the POI and the Marlowe-Crowne scale were administered.

In order to establish extreme liberal (profeminist) and conservative (traditional) groups, the 20 highest subject's scores and the 20 lowest subject's scores on the women's attitude scale were selected for subsequent data analysis. Liberal subjects had scores ranging from 122 to 154, whereas conservative subjects had scores ranging from 70 to 94. The mean score for the entire sample ($N = 98$) was 107.22, somewhat higher than that reported by Spence and Helmreich (8). Since directional predictions were made *a priori*, differences between the liberal and conservative groups on the POI scales were tested by one-tailed t tests, $df = 38$.

C. RESULTS

Means, standard deviations, and t s comparing liberal and conservative groups are presented in Table 1. The hypothesis predicted that women embracing liberal or profeminist attitudes toward their multiple roles in society would score significantly higher on the POI scales than would women endors-

TABLE 1
MEANS AND STANDARD DEVIATIONS OF LIBERAL AND CONSERVATIVE GROUPS
ON THE PERSONAL ORIENTATION INVENTORY SUBSCALES

Subscale	Liberal group		Conservative group		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Inner Directed	89.60	8.49	78.75	10.41	3.61**
Time Competent	18.50	1.66	15.25	3.51	3.74**
Self-Actualizing Value	20.65	2.78	18.90	2.75	2.00*
Existentiality	22.15	4.48	19.15	3.69	2.31*
Feeling Reactivity	17.10	2.62	14.30	2.98	3.16**
Spontaneity	13.70	2.47	11.45	2.09	3.11**
Self-Regard	12.80	1.99	10.80	2.40	2.87**
Self-Acceptance	16.10	2.91	13.90	3.05	2.33*
Nature of Man Constructive	12.70	1.98	11.85	1.88	1.39
Synergy	7.05	1.02	6.60	1.16	1.30
Acceptance of Aggression	17.60	2.89	15.05	2.71	2.88**
Capacity for Intimate Contact	19.45	3.50	16.60	3.41	2.21*

Note: All *t* tests are one-tailed, *df* = 38.

* $p < .05$.

** $p < .01$.

ing traditional attitudes. The data overwhelmingly confirmed this hypothesis. Liberal women scored significantly higher than conservative women on 10 of the 12 POI subscales. Six of the 10 POI subscales yielding differences between the two groups (Inner Directed, Time Competent, Feeling Reactivity, Spontaneity, Self-Regard, and Acceptance of Aggression) were significant at $p < .01$, whereas four (Self-Actualizing Value, Existentiality, Self-Acceptance, and Capacity for Intimate Contact) were significant at $p < .05$. No differences in mean scores for the two groups were found on the Marlowe-Crowne Social Desirability Scale (mean scores for liberal and conservative subjects were 13.90 and 14.25, respectively).

D. DISCUSSION

The results of this study convincingly indicated that college-aged females holding profeminist attitudes *vis à vis* their social and sexual roles exhibit a markedly higher level of personal growth than their peer counterparts expressing tradition-bound attitudes. Specifically, these findings suggest that profeminist subjects perceive themselves as relying more confidently upon their own internal norms without seeking constant support from others for self-validation (Inner Directed scale). The emphasis on self-reliance and autonomy is further strengthened by their ability to link past and future aspirations to present working goals in meaningful continuity (Time Competent scale). Liberal subjects are also less burdened by past guilts, regrets,

and resentments than are conservative subjects. In spite of any weaknesses or deficiencies, they accept and approve of their self-concept and are thus convinced of their own worth as persons. They are sensitive to their own needs and feelings and, despite their rejection of traditional society role expectations, are not fearful of expressing their feelings in spontaneous action. Because they accept aggression as a natural experience, they need not deny having such feelings. They describe themselves as being able to establish intimate relationships with others unencumbered by expectations and obligations. In sum, profeminist subjects live life according to the values and attitudes of self-actualizing people.

The possibility remains that this self-defined portrait of the profeminist personality simply represents response set differences between the two groups (i. e., profeminist subjects are more inclined to answer POI items in a socially desirable way). This explanation seems unlikely, since mean scores on the Marlowe-Crowne Social Desirability Scale were practically equivalent for the two groups. Furthermore, the POI has been shown to be resistant to fakability and directions to simulate a good impression (9).

Although the etiology of profeminist attitudes is presently unclear, it is probably a result of socialization experiences when early attempts to resist internalization of traditional role behaviors were met with parental approval. This is one area clearly deserving of additional research attention. It would also be fruitful to examine whether those who manifest profeminist attitudes are behaviorally committed to attempts to achieve changes in their role relationships with men. Finally, study of women's choice and pursuit of career aspirations as mediated by social and sexual role attitudes seems warranted. These possibilities offer a promising lead to future researchers in an area which has practical implications for personal and social development.

REFERENCES

1. CROWNE, D. P., & MARLOWE, D. A new scale of social desirability independent of psychopathology. *J. Consult. Psychol.*, 1960, 24, 349-354.
2. FOX, J., KNAPP, R., & MICHAEL, W. Assessment of self-actualization of psychiatric patients: Validity of the Personal Orientation Inventory. *Educ. & Psychol. Meas.*, 1968, 28, 565-569.
3. FRIEDAN, B. *The Feminine Mystique*. New York: Dell, 1963.
4. ILARDI, R., & MAY, W. A reliability study of Shostrom's Personal Orientation Inventory. *J. Hum. Psychol.*, 1968, 8, 68-72.
5. LEWIS, E. *Developing Woman's Potential*. Ames, Iowa: Iowa State Univ. Press, 1968.
6. MILLET, K. *Sexual Politics*. Garden City, N. Y.: Doubleday, 1970.

7. SHOSTROM, E. Manual: Personal Orientation Inventory. San Diego, Calif.: Educ. & Indus. Test. Serv., 1966.
8. SPENCE, J., & HELMREICH, R. The Attitudes Toward Women Scale: An objective instrument to measure attitudes toward the rights and roles of women in contemporary society. *JSAS Catalog of Selected Documents in Psychol.*, 1972, 2, 66.
9. WAREHIME, R., & FOULDS, M. Effects of a "fake good" response set on a measure of self-actualization. *J. Counsel. Psychol.*, 1971, 18, 279-280.

Department of Psychology

State University of New York, College at Brockport

Brockport, New York 14420

THE EFFECTS OF PEER VS. ADULT FRUSTRATION ON BOYS OF MIDDLE CHILDHOOD*¹

*Department of School Services, City College of the
City University of New York*

LEE SPIELBERG AND RICHARD RUTKIN

SUMMARY

This experiment investigated the effects of peer *vs.* adult frustration on aggressive responses of eight-year-old boys. In addition, the effect of frustration *vs.* nonfrustration on aggressive responding was tested.

In two experimental conditions, groups of four boys were brought into a room and read instructions preparing them for a game-competition situation. Either a peer or an adult confederate disrupted the group's goal completion. A control condition without disruption was also used.

Considerably more aggression was expressed in the peer condition than in the adult condition, on the basis of the aggression category of the Rosenzweig Picture-Frustration Test, Children's Form (20). Frustration in general led to significantly more aggression than no frustration.

The results indicated that boys of middle childhood are more attentive to and are likely to exhibit more aggressive reaction to peer frustration than adult frustration. In addition, frustration in general yielded more aggressive reaction than no frustration, supporting the original frustration-aggression theory proposed by Dollard *et al.* (8).

A. INTRODUCTION

Since the development of the frustration-aggression hypothesis (8, 16), the use of frustration in generating aggressive reactions has been an important factor in the study of childhood aggression. Even though subsequent research has demonstrated that aggression need not be the only response generated by frustration (1, 2, 3, 5, 7), the portion of the frustration-aggression hypothesis suggesting that the presence of aggression always presupposes frustration has remained intact.

* Received in the Editorial Office on April 25, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Reprints may be requested from the second author at the address shown at the end of this article.

More recently, efforts have been directed at varying the nature and intensity of the frustration experience (4, 10, 15, 17, 21) in order to observe the effects upon the expression of aggression. Hanner and Brown (10) showed that blockage of an expected goal will cause varying intensities of emotional states with aggression as a primary reaction. Doob and Sears (9) and later Cohen (6) demonstrated that fear of punishment represents a powerful inhibition to the expression of aggression. Cohen showed that when adults and peers both frustrated college students, differences in reaction occurred when the frustrating conditions were interpreted as arbitrary, and that with adults as frustrators, some blockage of aggression occurred resulting from fear of punishment.

The works of Buss (5), Burnstein and Worchel (4), and Pastore (17) demonstrate clearly that arbitrary frustration elicits stronger aggressive responses than frustration perceived as nonarbitrary.

Hicks (12) found that when four-year-old children were exposed to peer and adult aggressive models in a paradigm similar to that of Bandura, Ross, and Ross (2), the age status of the model did not appear to operate as a discriminative cue. It can thus be assumed that the shift in "moral" orientation from the original adult focus to that of the child's peers, as described by both the cognitive-developmental theorists (14, 18) and the social learning group led by Bandura, takes place after the age of four, and probably closer to Piaget's observations of a critical shift in orientation occurring for most children at about age seven.

Most of the research on childhood aggression has been useful in determining the nature and extent of adult influences on the aggression, but has failed to consider the child's age and his orientation towards peers and adults in relation to the expression of aggression. On the basis of the frustration-aggression hypothesis developed by Dollard and his colleagues (8, 16) and the notions of the child's changing cognitive orientation, together with the socialization changes of middle childhood from adult to peer orientation as observed by Piaget (18), the following hypotheses were tested:

Hypothesis 1. Frustrated eight-year-old boys will respond more aggressively than nonfrustrated boys of the same age on the aggressive "E" category of the Rosenzweig Picture-Frustration Test.²

Hypothesis 2. Peer frustrated eight-year-old boys will respond more aggressively than adult frustrated boys of the same age on the aggressive "E" category of the Rosenzweig Picture Frustration Test.

² The "E" category or extrapunitive category has been defined by Rosenzweig (19) as aggression directed onto the environment.

B. METHOD

1. Subjects

Thirty-six third grade boys in a public elementary school in New York City participated in the experiment. Their ages ranged from 8-0 to 8-10 with a mean of 8-3.

2. Apparatus

An 8' \times 10' room familiar to the children was used for the experiment.

The children assembled a plastic circular puzzle called Ringa-Majigs made by Molenaar, Inc., Willmar, Minnesota, stock # RJ 250.

One stopwatch and the Rosenzweig Picture-Frustration Test, Children's form (19, 20) were used.

3. Procedure

Ss were randomly assigned to nine groups of four. During their lunch period they were escorted to an empty classroom, and the *E* recited the following general instructions:

We want to see how well you can work together as a group. Your job is to put all the pieces that are in front of you together. You'll have to work very carefully and I will keep a record of the time it takes you to put all the pieces together. You'll have only one chance to do this, so work as carefully and quickly as you can. The group that puts the pieces together the fastest will win a \$5 prize that all of you can share. Now remember, work together, work quickly, and work carefully because you'll have only one chance. O.K., get ready and begin.

a. Condition 1. Three groups containing four Ss in each were given the general instructions and then allowed to begin the task. When five pieces of the puzzle remained for completion, a peer-confederate, without warning, rushed into the room, ran over to the work table, knocked down the existing work, and then ran out of the room. This destruction terminated these groups' opportunity to complete the task.

b. Condition 2. This condition, which also included three groups, differed from Condition 1 only in that the confederate was an adult and not a peer.

c. Condition 3 (control). Three groups of Ss began as in the other conditions, but were not at all interrupted and were allowed to proceed through the task to completion.

In all conditions each group, upon completion, was immediately administered the Rosenzweig Picture-Frustration Test in the same room. Ss were

allowed to complete the test at their own pace. Upon completion of the test, all Ss were informed that they were participating in a game and that the confederate upsetting the task had been told to do so. Ss were thanked for their participation and for being good sports and were given appropriate rewards.

C. RESULTS

An analysis of variance was carried out for the aggression scores in all conditions. The analysis showed a significant main effect ($F = 23.07$, $p < .01$, $df = 2, 33$), indicating that children who were subjected to human frustration, whether by peer or adult, responded more aggressively than the children in the control condition who had not been subjected to human frustration.

A t test was undertaken to determine specifically whether peer frustration led to more aggressive responding than did adult frustration. The resulting $t = 2.79$, $df = 22$, was significant at the .05 level of confidence, indicating that peer frustration tended to elicit significantly more aggressive responding than did adult frustration in terms of the "E" (extrapunitive) category of the Rosenzweig scoring system. Both hypotheses of this study were supported.

D. DISCUSSION

In the primary focus of this study it was found that eight-year-old boys, as did college students (6), responded more aggressively (in terms of the Rosenzweig "E" category) to peer initiated rather than adult initiated frustration. This finding is consistent with the Piagetian notion that the child's changing moral orientation from adults to peers clearly occurs before age eight (18).

The results of this study also go along with the observations of most socialization theorists (11, 13) that middle childhood is a period of ever-increasing attentiveness to peer behavior, values, and standards. Apparently this includes the patterning of an aggressive response repertoire in terms of peer frustration. The social and educational implications of these findings call for further investigation.

REFERENCES

1. BANDURA, A. & WALTERS, R. R. *Social Learning and Personality Development*. New York: Holt, Rinehart & Winston, 1963.
2. BANDURA, A., ROSS, D., & ROSS, S. A. Imitation of film-mediated aggressive models. *J. Abn. & Soc. Psychol.*, 1963, **66**, 3-11.
3. BROWN, J. S., & FARBER, E. Emotions conceptualized as intervening variables—with suggestions towards a theory of frustration. *Psychol. Bull.*, 1951, **48**, 465-495.

4. BURNSTEIN, E., & WORCHEL, P. Arbitrariness of frustration and its consequences for aggression in a social situation. *J. Personal.*, 1962, **30**, 528-541.
5. BUSS, A. H. *The Psychology of Aggression*. New York: Wiley, 1961.
6. COHEN, A. R. Social norms, arbitrariness of frustration and status of the agent of frustration in the frustration-aggression hypothesis. *J. Abn. & Soc. Psychol.* 1955, **51**, 222-226.
7. DAVITZ, J. R. The effects of previous training on postfrustration behavior. *J. Abn. & Soc. Psychol.*, 1952, **47**, 309-315.
8. DOLLARD, J., DOOB, L. W., MILLER, N. E., MOWRER, O. H., & SEARS, R. R. *Frustration and Aggression*. New Haven: Yale Univ. Press, 1939.
9. DOOB, L. W., & SEARS, R. R. Factors determining substitute behavior and the overt expression of aggression. *J. Abn. & Soc. Psychol.*, 1939, **34**, 293-313.
10. HANNER, C. F., & BROWN, P. A. Clarification of the instigation to action concept in the frustration-aggression hypothesis. *J. Abn. & Soc. Psychol.*, 1955, **51**, 204-206.
11. HARTUP, W. W. Peer interaction and social organization. In P. H. Mussen (Ed.), *Carmichael's Manual of Child Psychology* (Vol. III). New York: Wiley, 1970. Pp. 361-457.
12. HICKS, D. Imitation and retention of film-mediated aggressive peer and adult models. *J. Abn. & Soc. Psychol.*, 1965, **2**, 97-100.
13. KAGAN, J., CONGER, J., & MUSSEN, P. *Child Development and Personality*. New York: Harper & Row, 1969.
14. KOHLBERG, L., & ZIGLER, E. The impact of cognitive maturity on the development of sex-role attitudes in the years 4 to 8. *Genet. Psychol. Monog.*, 1967, **75**, 89-165.
15. KREGARMAN, J. J., & WORCHEL, P. Arbitrariness of frustration and aggression. *J. Abn. & Soc. Psychol.*, 1961, **63**, 183-187.
16. MILLER, N. E. The frustration-aggression hypothesis. *Psychol. Rev.*, 1941, **48**, 337-342.
17. PASTORE, N. The role of arbitrariness in the frustration-aggression hypothesis. *J. Abn. & Soc. Psychol.*, 1952, **47**, 728-731.
18. PIAGET, J. *The Moral Development of the Child*. New York: Harcourt, Brace, 1932.
19. ROSENZWEIG, S. The Rosenzweig Picture-Frustration Study, Children's Form. In A. Rabin & M. Haworth (Eds.), *Projective Techniques with Children*. New York: Grune & Stratton, 1960.
20. ROSENZWEIG, S., FLEMING, E. E., & ROSENZWEIG, L. The children's form of the Rosenzweig picture-frustration study. *J. of Psychol.*, 1948, **26**, 141-191.
21. ROTHBAUS, P., & WORCHEL, P. The inhibition of aggression under non-arbitrary frustration. *J. Personal.*, 1960, **28**, 108-117.

Department of School Services
City College of The City University of New York
New York, New York 10031

SOCIAL COMPARISON OF ABILITIES IN BLIND CHILDREN AND ADOLESCENTS*¹

*California State College, San Bernardino and Haile Sellassie I University,
Addis Ababa, Ethiopia*

STEPHEN F. MORIN AND REGINALD L. JONES

SUMMARY

The present study investigates Festinger's theory of social comparison processes that predicts the choice of one similar to oneself for comparison of abilities. This study specifically seeks to assess the influence of (a) level of relevance and (b) level of difficulty on the choice of blind as a reference group in evaluating abilities by 45 blind, school-age Ss. The results suggest that both level of relevance and level of difficulty may significantly affect social comparison behavior. Possible elaboration of Festinger's theory and its integration into developmental theory are suggested.

A. INTRODUCTION

The present study follows from Festinger's theory of social comparison processes, which states that "given a range of possible persons for comparison, someone close to one's own ability or opinion will be chosen for comparison (2, p. 121)." More specifically, the present study attempted to find support for the necessity of considering both the level of relevance and level of difficulty of a task to the choice of the blind as a reference group for social comparison of opinions by blind, school-age Ss.

In recent years, those studies following from the theory of social comparison processes have generally focused on the role of similarity as a critical factor in the choice of a reference group for comparison purposes. Unlike almost all of the studies reported using college undergraduates as subjects, Strauss (3) studied reference groups and social comparison behavior among totally blind adults. These findings suggested a high percentage of the adult blind report

* Received in the Editorial Office on April 26, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ These data were collected as part of a thesis by the first author under the direction of the second author at the Ohio State University, Columbus, Ohio. The research was supported by a faculty professional development grant from the California State College, San Bernardino. The authors wish to thank Susan Grubb and Bobby Jo Sonnier for their assistance.

avoiding comparison behavior altogether, and when comparison behavior was reported, the sighted were likely to be chosen as the comparative reference group. Differences were reported between the percentages choosing the blind on the evaluation of appearance, learning ability, and character, all of which differ in their degree of relevance to blindness.

This study employed a structured interview procedure with institutionalized, blind, school-age Ss as part of an attempt to provide a test of social comparison in a naturalistic setting. The blind by virtue of their common disability form a strategic group for the testing of social comparison theory. The prediction in the present study was that manipulating the degree of relevance of a given ability to blindness would significantly affect the frequency with which the blind were chosen as a reference group for social comparison purposes. A second and related hypothesis predicted that manipulating the level of difficulty of a given task would significantly increase the choice of the blind as a reference group. If the conclusions from the Strauss study are correct, the choice of the blind as a reference group on difficult tasks would protect the self-regard of the blind person by providing a less competitive group for comparison.

B. METHOD

1. *Subjects*

The subjects for the present study were 45 resident students at the Ohio State School for the Blind in Columbus, Ohio. Ss were divided into two groups by age. The younger group, referred to here as the childhood sample, consisted of four girls and 11 boys between six and 11 years of age. The older group, referred to here as the adolescent sample, consisted of 15 girls and 15 boys between 13 and 18 years of age. In order to qualify for the study, Ss were required to be totally blind or have only minimal light perception. Those with object perception and those not totally blind before the age of five years were not included in the sample. All students at the school who met the requirements of the study were used.

Because of the restrictiveness of subject selection, several differences in demographic characteristics were present in the sample. Boys were significantly older than girls in the childhood sample ($t = 2.91, p < .05$); mean age of the total childhood sample was 9.42. In the adolescent sample, girls were slightly older than boys, although the difference is insignificant ($t = 1.73$); the mean age of the total adolescent sample was 15.69. Boys had attended the state school significantly longer than had girls in the childhood

sample ($t = 4.483$, $p = < .01$); the difference in the adolescent sample was not significant.

2. Procedure

Each subject was interviewed separately for approximately 35 minutes in a room set aside in the hospital at the school. The interview, consisting of the Social Comparison of Abilities Questionnaire and the first of the performance items, was put on a Wollensak tape recorder and played to each subject. If the *S* did not understand the instructions, or if he wished a question repeated, the tape was stopped, and the *E* repeated or answered the question. In order to assess the validity of the self-report measure of social comparison behavior, one week after the interviews were completed, 28 of the 30 *Ss* in the adolescent sample were group administered a Children's Social Desirability Questionnaire (1), and scores were correlated with each item of the entire interview. In no case was there a significant correlation ($p < .05$), indicating at least partial support for the validity of the self-report measure.

3. Social Comparison of Abilities Questionnaire

In the questionnaire developed for the present study, the respondent was asked to judge the goodness of his typical performance on six abilities, three of which were designed to be of high relevance to blindness (e.g., getting around) and three of which were designed to be of low relevance to blindness (e.g., paying attention). After the *S* had made an evaluation of his ability, he was asked when thinking of how good he was at a particular ability, did he think of himself in comparison with blind children or sighted children of his own age. The introductory instructions presented *Ss* with four alternatives: (a) comparison with blind, (b) comparison with sighted, (c) comparison with both blind and sighted, and (d) no comparison. Examples of questions presented are as follows:

(a) How good are you at getting around? (Very good, good, fair, poor, very poor.)

(b) When you think of how good you are at getting around, do you think of yourself in comparison with (boys/girls) of your own age who are blind or who can see?

Those questions designed to be relevant to blindness concerned getting around, reading, and earning money when one gets out of school. Those questions designed to be of low relevance to blindness concerned paying

attention to the teacher, remembering what one hears, and staying out of trouble.

4. *Performance Items*

At the end of the interview, two performance tasks were presented to each *S*. Task one consisted of two trials of counting beeps in which the *S* was asked to judge how well he did at counting the beeps and what reference group he was using to make this evaluation. The first trial consisted of 14 beeps presented very quickly; the second trial consisted of four beeps presented very slowly. Taken as a whole, the beep counting task was designed as one irrelevant to blindness. The 14-beep task presented very rapidly was designed to be of high difficulty; the 4-beep slow task was designed to be of low difficulty.

Task two consisted of bead stringing, where the *S* was asked to string beads of four different colors and four different shapes on metal poles that were provided. The *Ss* were told the different beads were of different colors to emphasize further the advantage a sighted person would have on this task. Each *S* was first introduced to the beads and then told their color as he felt their shape. A box held 16 red beads shaped like spools of thread, and 32 orange beads shaped like doughnuts. Each *S* was presented with a pre-strung pole to serve as a model and asked to generate the same pattern on several empty poles as quickly as possible. Each *S* was told that he had two minutes to complete the task and that he would be racing against time. After two minutes, the *S* was stopped, and the number of correctly strung beads was counted. The *S* was given his score and asked how he felt he had done. He rated his performance as "very good, good, average, poor, or very poor." After the judgment was made, the *S* was asked when making his evaluation whether he compared himself with blind children or children who could see. This task was designed to be highly relevant to blindness.

C. RESULTS

In order to analyze the data, a number of comparisons were made between the number choosing to compare with the blind and the number choosing to compare with any of the categories of "sighted," "both blind and sighted," or "no comparison." Responses were thus dichotomized into number choosing blind and number choosing other. Responses were then cross-tabulated, generating a separate contingency table for each question; these are presented in Table 1.

Because of the sampling problem encountered with the younger group of

TABLE 1
CHOICES BY DIMENSION OF COMPARISON FOR CHILDHOOD AND ADOLESCENT SAMPLES

Dimension of comparison	Number choosing blind		Number choosing other	
	Child (<i>N</i> = 15)	Adolescent (<i>N</i> = 30)	Child (<i>N</i> = 15)	Adolescent (<i>N</i> = 30)
Ability questionnaire				
1. Mobility	6	18	9	12
2. Attention	5	3	10	27
3. Reading	7	18	8	12
4. Remembering	4	4	11	26
5. Earning power	3	8	12	22
6. Staying out of trouble	1	4	14	26
Performance tasks				
1. Beep counting				
(a) 14 fast beeps	7	7	8	23
(b) 4 slow beeps	6	2	9	28
2. Bead stringing	12	28	3	2

SS, the hypotheses were tested only on the adolescent sample. Analyses using the combined sample ($N = 45$) did not differ substantially from those using the adolescent sample alone ($N = 30$).

In order to test the hypothesis concerning the influence of the relevance dimension on direction of comparison choice, a sign test was made between responding on each of Questions 1, 3, and 5 with each of Questions 2, 4, and 6. Significant differences were found as predicted on each of the three comparisons made to Questions 1 and 3 ($p < .001$). Question 5 on Earning Power differed significantly from Questions 2 and 6 ($p < .05$), but not significantly from Question 4. Also, as predicted, a sign test indicated no significant difference between Questions 2, 4, and 6, those pairs of questions designed to measure the same things. Likewise, Questions 1, 3, and 5 showed no significant differences with the exception of the comparison of Questions 3 and 5 ($p < .05$). As predicted, a sign test indicated that the choice on beep counting Trial 1 differed significantly from the choice on bead stringing ($p < .001$). Substantial support was thus found for the influence of the relevance dimension.

The hypothesis concerning the level of difficulty was again tested by a sign test between responding on Trial 1 and Trial 2 of the beep-counting task. As predicted, the blind were selected significantly more frequently on the counting of the 14 rapid beeps than on the counting of the four slow beeps ($p < .01$). Support is thus found for the hypothesis concerning the influence of level of difficulty on the choice of an evaluative reference group.

A correlational analysis of differences between the childhood and adolescent samples indicated that the younger sample chose the blind significantly more

frequently than the older sample in evaluating their ability at counting the four slow beeps (Phi coefficient = .41, $p < .01$). Because of the restrictiveness of the younger sample, a similar analysis of sex differences was computed only on the adolescent sample. Boys were found to choose the blind significantly more frequently than girls for comparison of their reading ability (Phi coefficient = .41, $p < .05$). None of the other comparisons was significant.

D. DISCUSSION

The results of the present study seem to suggest even further refinement of Festinger's theory of social comparison processes. First, the degree of relevance of the question to be answered to the source of similarity between the individual and the reference group must be considered. The blind were chosen significantly more frequently on those items that were of high relevance to blindness than on those that were of low relevance to blindness. An elaboration of Festinger's theory should clarify similarity to include the dimension of relevance. Second, the Festinger model should be expanded to include the dimension of level of difficulty. It appears that as tasks increase in difficulty, when two or more groups are available for comparison, the group that yields the more favorable comparison will be the one chosen. In the present study, as performance tasks became more difficult, the blind were chosen with greater frequency than any reference group including the sighted even though the task was not directly related to blindness. The results taken as a whole are consistent with Festinger's theory.

An additional qualifying consideration of similarity as the determining factor in social comparison choice may be age. It should be noted that unlike the Strauss findings with adults, there were extremely few reports of avoiding comparison behavior among the school-age Ss. The two samples also differ greatly in the choice of the blind as a reference group. Several variables, such as institutionalization, amount of sight perception, the availability of other blind individuals, age of onset of blindness, may affect the choice of the blind as a reference group and are worthy of systematic investigation. In the analysis of differences between the childhood and adolescent samples, the younger Ss chose the blind significantly more frequently when evaluating their ability to count slow beeps. This may reflect developmental differences in the ability to assess degree of relevance. The finding that boys prefer to compare their reading ability to other blind children's reading ability more frequently than do girls may well reflect the greater difficulty that reading

presents to boys. The integration of social comparison theory into a developmental theory is suggested.

REFERENCES

1. CRANDALL, V. C., CRANDALL, V. J., & KATOVSKY, W. A. A children's social desirability questionnaire. *J. Consult. Psychol.*, 1965, **29**(1), 27-36.
2. FESTINGER, L. A theory of social comparison processes. *Hum. Relat.*, 1954, **7**, 117-140.
3. STRAUSS, H. M. Reference group and social comparison processes among the totally blind. In Hyman, H. H. & Singer, E. (Eds.), *Readings in Reference Group Theory and Research*. New York: Free Press, 1968.

Department of Psychology
California State College, San Bernardino
5500 State College Parkway
San Bernardino, California 92407

INFORMATION FEEDBACK SCHEDULES, INTERPOLATED ACTIVITIES, AND RETENTION*¹

New York University

GARY M. KIPPEL²

SUMMARY

Fifth grade students were administered a reading passage followed by a multiple-choice test based upon that passage. Feedback regarding performance was provided according to a standardized procedure either immediately after the test or with a delay of two and one-half hours. In the two delayed feedback treatments students participated in activities interpolated between the multiple-choice test and feedback which were either similar or dissimilar to the initial reading activity. In all treatments a retention test was administered either immediately after feedback or three days later. Contrary to widespread pedagogic belief, results demonstrated no significant differences among groups who received immediate or delayed feedback with either similar or dissimilar interpolated activities. In addition, no significant difference was demonstrated between retention tests administered either immediately or three days after feedback.

A. INTRODUCTION

In most classrooms students participate in lessons including material which they read. Subsequently, an examination usually is administered both for evaluation purposes and to provide a basis for review of the lesson. When should feedback regarding test performance be provided in order to optimize retention of the reading material? On the basis of learning theories of Hull, Skinner, and Thorndike, immediate information feedback and knowledge of results have been accepted by most educators as crucial for optimal retention. Recent empirical evidence (e.g., 1, 2, 4, 6, 8), however, has cast doubt on this principle by demonstrating that delayed information feedback (DIF)

* Received in the Editorial Office on May 2, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The generous assistance of Professor Inez L. Smith in various phases of this investigation is acknowledged.

² Requests for reprints should be sent to the author at the address shown at the end of this article.

may lead to retention which is equal or superior to immediate information feedback (IIF). Accordingly, this study attempts to demonstrate the relationship between immediate and delayed information feedback.

Immediately following the reading lesson should students be provided lessons which are similar or dissimilar to optimize retention of the material provided during the initial reading lesson? There is empirical evidence [see, for review, Woodworth and Schlosberg (9, pp. 761-770)] suggesting that the similarity between a lesson and subsequent lessons affects retention of material covered in the initial learning situation. Specifically, with a high degree of similarity retroactive inhibition would be expected to result in relatively poor retention. A second objective of this study, therefore, is to determine if the similarity of a subsequent lesson affects retention of reading material.

It must be noted that other investigations [see, for example, Sassenrath and Yonge (5); Sassenrath and Yonge (6); and Sturges (7)] have demonstrated differential findings depending upon whether retention tests are administered after information feedback immediately or with some delay. In the present investigation, therefore, one-half of the subjects in each of the three experimental treatment groups received a retention posttest immediately after feedback and the other half received a three day delayed posttest. In no instance was the same individual administered both retention tests.

In this investigation, information feedback refers to knowledge that is provided subjects indicating whether responses to multiple-choice questions are correct or incorrect. Operationally, immediate information feedback (IIF) refers to the experimental treatment in which subjects are provided feedback immediately after taking a multiple-choice test. In the delayed information feedback treatment (DIF) there is a delay of two and one-half hours between the multiple-choice test and feedback regarding test performance. Interpolated activities occur only in the DIF treatments. They are similar or dissimilar to the initial lesson and take place immediately after the multiple-choice test before feedback is provided.

The following two hypotheses were formulated and tested: (a) Delayed information feedback will result in greater retention than will immediate information feedback, and (b) Dissimilar activities following a reading lesson will result in greater retention than will similar activities. Though no specific hypothesis is offered in regard to the retention tests, data are analyzed to assess differences between immediate and delayed retention.

B. METHODOLOGY

1. *Reading Selection*

The 126 word reading passage was selected from page 15 of book A of the McCall-Crabbs (3) "Standard Test Lessons in Reading." According to the publisher, Book A is appropriate for second through sixth grade students. The specific passage, dealing with schools of long ago, was selected after consultation with nonparticipant fifth grade teachers. It was considered of appropriate difficulty for less able fifth graders.

2. *Measuring Instruments*

A 10-item four alternative multiple-choice test based upon the reading selection served as the initial test and retention test. In this study, the initial test was conceived of as part of the initial learning situation. The retention test, which served as the dependent variable measure, consisted of the same items as the initial test presented in an order different from that of the initial test. The order of items was determined in a random manner.

3. *The Sample*

Data were obtained from 60 fifth grade children in an elementary public school in New York City. Subjects were either 10 or 11 years old and represented lower socioeconomic groups. Their Metropolitan Reading Achievement Test grade equivalent scores ranged from 2 through 5.8, with most participants at least one year behind the grade five norm.

4. *Experimental Procedures*

The experimental treatment consisted of administration of the reading selection followed by a test based upon that selection. After the reading passage was distributed, various pupils read aloud, while others followed along in their seats. Subsequently, it was collected, and the initial test was distributed. Students wrote their names on the test papers. The experimenter read the directions for the test, reviewed the sample item, and answered questions regarding instructions. Students then took the test. There was no time limit. After the entire group finished, the experimenter collected the test papers.

Experimental treatments were assigned randomly to classes. In the IIF condition information feedback was provided immediately. In the two DIF conditions, two and one-half hours elapsed before the answer key and addi-

tional feedback were provided. During the delay, subjects in the DIF experimental treatments participated in activities which were either similar (DIF-S) or dissimilar (DIF-DS) to the initial reading activities. Specifically, DIF-S subjects read short stories in Scott-Foresman basal readers, used Science Research Associates reading laboratory materials, and read stories from Continental Press reading rexographs. Subjects in the DIF-DS condition spent the intervening two and one-half hours going to the gymnasium, doing arithmetic examples and playing games. Reading was not integral to any activities instituted during this period for students in the DIF-DS experimental treatment group.

Information feedback was provided in a standardized manner either immediately or with a two and one-half hour delay. During information feedback, an answer key which indicated the item and the number of the correct answer was distributed. Total scores were not provided. The experimenter read each item and correct choice. The class was asked to locate a specific sentence of the reading selection in order to verify the correct response to each item.

Subjects were administered a retention test after information feedback either immediately or three days later. The retention tests were assigned to subjects based upon odd and even rows. This appointment procedure was established after discussion with all participating teachers indicated that students were not assigned systematically to seats. For example, immediately after information feedback the immediate retention test was distributed to rows 1, 3, and 5, while subjects in rows 2, 4, and 6 were provided other rexographed materials. Three days later, the retention test was administered to rows 2, 4, and 6, while rows 1, 3, and 5 worked on other rexographed materials. In this manner, all groups were provided information regarding the correctness of answers, and the test administered after feedback was an index of how much they retained.

The initial test scores provide a covariate measure. This covariate analysis was instituted in order to adjust statistically each of the experimental treatments on the initial test measure so that effects on a retention test of information feedback schedules and interpolated activities could be examined. For the statistical analyses, the types of information feedback and the retention tests represent the independent variables. The three types of feedback are as follows: immediate information feedback (IIF), delayed information feedback with similar interpolated activity (DIF-S), and delayed information feedback with dissimilar interpolated activity (DIF-DS). The two levels of the retention tests are the immediate and three day delayed reten-

tion test. This 3×2 experimental paradigm has 10 subjects in each of its six cells resulting in a total of 60 subjects. Performance on the retention test serves as the measure of the dependent variable.

C. RESULTS

1. *Assessment of Retention*

The final sample consisted of 60 subjects for which the retention test mean was 7.75 with a standard deviation of 2.70. The reliability of the retention test for this sample was .72, as estimated by coefficient alpha. Item difficulties ranged from .32 to .85 with a median of .69. Item-total correlations ranged from .10 to .72 with a median of .60. Each paper was graded twice by independent scorers and there was perfect rater agreement on all scores.

2. *Treatment of Data*

The information feedback treatment means varied as follows: IIF (6.60), DIF-S (8.00), and DIF-DS (5.25). A two-way analysis of variance on the criterion variable resulted in a significant F ($F = 6.037$, $2/54$ df , $p < .01$) for the information feedback variable. The retention test main effect ($F = .023$, $1/54$ df) and the interaction ($F = .303$, $2/54$ df) were not significant. This analysis, however, disregards the presence of the covariate.

It is crucial to determine if differences between the three-level information feedback main effect remain after a statistical adjustment has been made for the effects of the covariate. Accordingly, the effect of initial test scores was removed from each information feedback group. This resulted in adjusted means of 7.11, 8.35, and 7.78 for the immediate, delayed-similar, and delayed-dissimilar treatments, respectively. The respective differences between the original means and the adjusted means were .51, .35 and 2.53. It should be noted that the adjusted mean of the immediate information feedback group represents the lowest retention score.

Two-dimensional factorial analysis of covariance was employed to analyze the results. A test for homogeneity of within-class regression resulted in a nonsignificant $F = 1.167$ ($5/48$ df , $p < .01$). The experimental data, therefore, do not contradict the hypothesis of homogeneity of within-class regression. Thus, one of the major assumptions underlying analysis of covariance is no longer an assumption in this particular analysis.

The analysis of covariance is summarized in Table 1. The experimental data indicate that statistically significant differences between the criterion scores for the treatment groups do not exist after adjustment is made for the linear effect of the covariate.

TABLE 1
ANALYSIS OF COVARIANCE SUMMARY TABLE FOR RETENTION

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>
Retention tests	.671	1	.671	.165
Information feedback schedules	14.651	2	7.326	1.805
Retention tests × Information feedback schedules	6.501	2	3.251	.801
Error	215.049	53	4.058	
Total	236.872	58		

D. DISCUSSION

Analysis of variance of retention scores without adjustment on the covariate resulted in statistically significant differences for the information feedback treatment. Significant differences did not result, however, when scores were adjusted for the covariate. Within the parameters of the present investigation, this outcome demonstrates that information feedback schedules and similarity of interpolated activities did not significantly affect retention once subjects had been statistically equated on the initial measure. Since information feedback schedules did not lead to significantly different retention, the results can be interpreted as opposed to those educators who regard immediate information feedback as essential to optimal learning. At the same time, the findings are not in accord with theorists who believe that delayed feedback facilitates retention.

Demonstration of different outcomes with analysis of variance and covariance techniques signifies that future studies of information feedback schedules must be certain experimentally or statistically to equate subjects. In educational studies of this nature it is rarely possible to assign randomly subjects to experimental treatments. It is desirable, at least, statistically to equate subjects for the purposes of data analysis. This is not done frequently. Resulting findings could, therefore, be an artifact of biased sampling.

It should be noted that there are several important differences between this study and previous investigations of information feedback schedules. The statistical analysis, involving a test of homogeneity of regression and a factorial analysis of covariance with the initial test covariate, is a more rigorous procedure than has been followed elsewhere. One exception, however, is the investigation by More (4) which used *IQ* and grade reading level as covariates. It is likely that the initial test covariate in the present study has a higher correlation with retention test scores than does *IQ* and reading grade

level. It may, therefore, be more difficult to obtain significant results with the initial test covariate used in the current investigation.

Other differences between empirical investigations include age of subjects, content and length of the reading passage, kind and number of items in the multiple-choice test, and provision of the question stem and total test score as part of information feedback. In effect, the experimental treatments and instruments involved in various studies of information feedback do not appear similar.

The current investigation must be replicated with a more extensive sample to determine the extent to which findings are conclusive and can be generalized. Implications of this research are very important for the classroom teacher. If an optimal period for information feedback exists, educators must be informed of its parameters.

REFERENCES

1. ENGLISH, R. A., & KINZER, J. R. The effect of immediate and delayed feedback on retention of subject matter. *Psychol. in Sch.*, 1966, **3**, 143-147.
2. KIPPEL, G. M. Information feedback, need achievement and retention. Doctoral dissertation, New York University. Available as No. 73-19, 430, University Microfilms, Ann Arbor, Michigan, 1973.
3. MCCALL, W. A., & CRABBS, L. M. Standard Test Lessons in Reading—Book A. New York: Bur. Publications of Teachers Coll., Columbia Univ., 1961.
4. MORE, A. J. Delay of feedback and the acquisition and retention of verbal materials in the classroom. *J. Educ. Psychol.*, 1969, **60**, 339-342.
5. SASSENATH, J. M., & YONGE, G. D. Delayed information feedback, feedback cues, retention set, and delayed retention. *J. Educ. Psychol.*, 1968, **59**, 69-73.
6. ———. Effects of delayed information feedback and feedback cues in learning on delayed retention. *J. Educ. Psychol.*, 1969, **60**, 174-177.
7. STURGES, P. T. Verbal retention as a function of the informativeness and delay of informative feedback. *J. Educ. Psychol.*, 1969, **60**, 11-14.
8. ———. Information delay and retention: Effect of information in feedback and tests. *J. Educ. Psychol.*, 1972, **63**, 32-43.
9. WOODWORTH, R. S., & SCHLOSBERG, H. *Experimental Psychology* (rev. ed.). New York: Holt, Rinehart & Winston, 1954.

1180 East 18 Street
Brooklyn, New York 11230

A METHOD OF CLUSTERING PERSONS' PROFILES*

The Pennsylvania State University and Temple University

DONALD B. KEAT, II, AND ROY B. HACKMAN

SUMMARY

After the determination of the basic dimensions of occupational interests by means of the BC TRY (B = Berkeley; C = Chapter; TRY = Tryon, or to Try new computer ideas) system of cluster analysis of test items (V-analysis), (the) individuals were grouped together on the basis of the similarity of their inventory profiles into person-clusters (O-analysis). The result was a successful condensation of a large number ($N = 500$) of individuals, on the basis of their test profiles, into a smaller number of core O-types (i.e., groups of persons with similar profiles): namely, 11. In any particular O-type, homogeneous groups tended to cluster together. That is, for a particular curricular group there was at least one O-type profile representing an attraction pattern (presence in the O-type) and an O-type profile representing an avoidance pattern (absence from the O-type).

A. INTRODUCTION

The specific purposes of this study were twofold. The first one was to analyze the vocational interest inventory response patterns for 500 male college juniors and seniors by means of a cluster and factor analysis of the items of the *Occupational Interest Inventory for Higher Education* (4). For a fuller development of this aspect of the analysis, the interested reader will find details of the "item-cluster" or test development aspect in another article (6). This analysis was essential in order to perform the second phase of the study: namely, grouping the individuals into core O-types ("person-clusters"). The focus of the present article is on this second purpose (8). [The basic terms that were utilized in this research are from Tryon (12, 13) and Tryon and Bailey (14, 15).]

1. V-Analysis

This was the process of reducing a large number of variables (items of an interest inventory) to a smaller number of general dimensions. This procedure

* Received in the Editorial Office on May 3, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

involved a direct solution for the number of dimensions that accounted for the similar correlational patterns. The defining items of each dimension were selected statistically. The resulting dimensions (item-clusters) must have obvious similarity of content. This procedure was essentially an empirical search for the general dimensions of the inventory content which are based on the item-cluster structure.

2. O-Analysis

Following V-analysis, the second main goal was the clustering of similar objects (O-types). In this case, the objects were the profiles of 500 individuals in the sample. The basic data were the score profiles of the persons which resulted from scoring the protocols with the use of keys based on the dimensions that were derived from the V-analysis. The process first located the core O-types and then assigned individuals to the various core O-types on the basis of profile similarity. Thus the person-clusters (O-types) were composed of individuals with similar profiles.

B. METHOD

1. Measures

There were two measurement devices utilized in this study. The first was the *Occupational Interest Inventory for Higher Education*, Form A, Males (4), which was designed as an interest measuring instrument for male college students. The 160 items in the inventory refer to vocations that generally require training beyond high school—e.g., technical or college—and consist of job titles and descriptions. There were no personality items included in this inventory. The response format involved responding to each item on a four-point scale: i.e., from liking (L) a job to disliking it (D), with mid-categories to indicate greater interest (L?) than uninterest in it (D?).

The second investigatory instrument was the *College Questionnaire* which was developed for the study. This was used to determine the college major and various curricular areas of the students. It is in multiple-choice format which permits transmittal of the respondents' information to IBM cards. Copies of this questionnaire are available from the authors on request.

2. Subjects

The interest inventory and college questionnaire were administered to groups of college juniors and seniors. Juniors and seniors were selected because they had committed themselves to a major by this time (e.g., 9, 10). Their probability of success (2) is greater at this time than during the first

two years. These groups were drawn from some colleges in Philadelphia and from other colleges within a radius of approximately 100 miles of Philadelphia. A stratified sample of 500 male college juniors and seniors was chosen from over 800. These subjects were enrolled in the following five major curricular areas: liberal arts-arts ($N = 125$), liberal arts-science ($N = 45$), engineering ($N = 70$), education ($N = 130$), and business ($N = 130$). Standardized instructions were used in testing all groups.

3. Statistical Analyses

The major statistical analysis of the *Occupational Interest Inventory for Higher Education* was the cluster and factor analysis of items and profiles. This crucial aspect of the study was conducted on the IBM 7094 Computer at the University of California in Berkeley. The methods of analysis were developed under project CAP (Cluster Analysis Programs). This project was supervised by the late Dr. Robert C. Tryon, who first proposed cluster analysis more than a quarter century ago (11). However, it was not until the recent rise of the computer that this approach became feasible. The culmination of his thinking has been compiled in a book on cluster analysis (15).

The variable (V-) analysis was begun with the preparation of control cards (15). The original data (Subject $N = 500$, Item $N = 120$) were submitted. Data from the first two cards included 120 items which were selected from the job titles and job descriptions. These items were chosen both from a 160×160 intercorrelational matrix and on the basis of their factor loadings, previously determined by the Wherry-Winer iterative (16) method which resulted in eight factors (1). From the final cluster analysis, the 14 interest dimensions (see Table 1) were ascertained (6). These clusters were of a high order of reliability (alpha reliabilities in the range = .87 to .96). Factor coefficients were determined for each item. The factor and cluster scoring component of the program computed the Z scores (Mean = 50 and $SD = 10$) on each cluster whose definers were selected in the preset key cluster analysis. The next step, the one on which this paper focuses, was the O-analysis: that is, the cluster analysis of objects (profiles of individuals). The condensation method of O-analysis is an iterated condensation of the individuals ($N = 500$) around a small number of core O-types.

The O-analysis of profiles based on 14 dimensions produced 11 core O-types. The O-type (object typing) is the Euclidean distance clustering analysis (15). This process assigns all the individuals to arbitrary sectors in the cluster score space of 14 dimensions, and selects as core O-types those sectors

containing 10 or more individuals (at least 2% of the group). It reassigned all of the individuals to these core types and iterated the process to a final solution consisting of varying numbers of O-types plus a number of unique individuals who did not fit into any of the O-types selected. The last step is the computation of the hierarchical order of the O-types.

OBJECT STATISTICS (i.e., the calculations on the O-clusters from the dimension scores used to determine the O-clusters) lists the cluster scores of the members of each of the O-types produced by the last iteration of the O-type program. For each O-type, the means, standard deviations, and homogeneity of scores were computed on each dimension. Further, the correlation ratio (η) of each dimension on the discontinuous series of O-types was calculated.

This completed the BC TRY procedures of statistical analysis of the variables or items (V-analysis), and the O-analysis of individual profiles for the sample of 500 male college juniors and seniors. After the curricular group frequencies were recorded for each O-type, the chi square test was used to determine whether or not there was any significant relationship between the curricular areas and the O-types.

C. RESULTS

After the dimensions were determined on the basis of the V-analysis, all of the individual protocols were scored on these dimensions, at which point they were grouped into core O-types consisting of persons having similar profiles. The 14 dimensions resulting from the V-analysis are shown in Table 1.

The goal of this analysis was to determine if a large number of individual profiles ($N = 500$) could be condensed into "person-clusters" based on similar profiles. After resolving a unique solution to the problem of a large number of dimensions [this was the first time that more than five dimensions were analyzed on the BC TRY system; see Tryon and Bailey (15, p. 181)], 11 core O-types resulted. Only 10 unique individuals were omitted from the sample of 500. Tests of significance were applied to determine presence or absence of individuals from certain curricular areas in particular O-types. Table 2 provides a summary of the 14 dimensional analysis.

In this table the number in a cell is the obtained frequency of people from a particular curricular area whose profile is in a certain O-type. For example, for the education majors, there was one O-type of attraction (O-type 11) and one of avoidance (O-type 3). It was found (see Table 2) that there is

TABLE 1
MEAN STANDARD SCORES OF 14 DIMENSIONS FOR EACH O-TYPE

O-Type	Dimensions													
	2	7	8	12	14	1	4	9	13	3	5	6	10	11
1	35	39	40	36	36	40	39	40	41	40	45	40	45	43
2	43	41	44	40	38	46	46	43	46	59	41	55	50	42
3	55	45	48	49	49	41	44	40	41	41	40	40	37	37
4	53	50	60	56	51	49	58	53	46	45	44	46	42	45
5	61	58	60	60	60	40	40	41	42	44	45	44	45	46
6	56	56	47	53	59	45	41	44	44	49	56	45	51	56
7	56	57	53	56	57	49	51	54	49	59	55	59	60	54
8	40	49	41	41	46	46	44	50	44	50	59	51	59	53
9	39	40	45	40	37	60	60	56	59	43	42	49	40	44
10	46	47	47	47	47	59	56	55	60	54	52	55	55	53
11	57	59	61	60	58	61	61	60	64	54	59	55	52	60

Note: Vocational interest dimensions are as follows: 2. Business management; 7. Business administration; 8. Business math; 12. Business technical; 14. Business personnel; 1. Conservation; 4. Science research; 9. Medical science; 13. Agriculture; 3. Music; 5. Social welfare; 6. Artistic; 10. Communication; 11. Educational.

at least one representative O-type pattern for each curricular group: i.e., at least one profile pattern in which a particular group is significantly present (representing acceptance of the O-type pattern). There is also at least one in which a group is significantly absent (rejection of the O-type pattern).

Figure 1 illustrates the two significant values for the education curricular groups. The O-type to which this group is significantly attracted is that of number 11. This is a highly elevated profile in which most of the persons indicated a generalized interest in the inventory items. This could reflect some kind of "yea-saying" response bias on the part of education majors or lack of specificity of interests in general. Another possibility would be that although these persons were grouped as education majors, they could have various subject matter areas as their specific interests: e.g., business practice, music, science, etc. The O-type which is significantly rejected by the education people is that of O-type 3. Inspection of this generally low elevation profile indicates that only the business dimension is above the mean, while all others are below it, with the educational dimension score being the lowest one of all. This represents a profile group in which the engineering and business majors are predominant. This outcome could be a result of a cropping situation in the engineering field that after the degree is attained in engineering, the engineer then goes on to obtain a master's degree in business administration.

In summary, inspection of Table 2 verifies that there are representative

TABLE 2
DISTRIBUTION OF PERSONS IN CURRICULAR GROUPS ACCORDING TO O-TYPES

Major	1	2	3	4	5	6	7	8	9	10	11	Σ
Liberal Arts (Arts)	5	9	3	2 ^a	7	20	20	23 ^b	2 ^a	22	8	121
Liberal Arts (Science)	1	5	2	0 ^a	0 ^a	0 ^a	3	3	16 ^b	11	4	45
Engineering	2	9	10 ^b	14 ^b	2	4	6	0 ^a	8	6	9	70
Education	9	9	2 ^a	13	4	15	10	14	11	20	19	126
Business	4	7	15 ^b	14	25 ^b	22	16	2 ^a	2 ^a	15	6	128
Totals	21	39	32	43	38	61	55	42	39	74	46	490

Note: $\chi^2 = 195.95$ ($p < .01$).

^a This number is significantly lower than that expected if the profiles were distributed among the majors by chance.

^b This number is significantly in excess of what would be expected by chance.

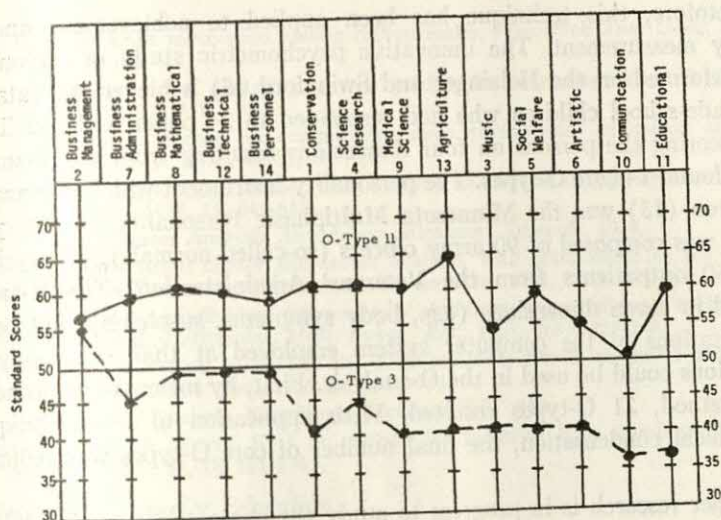


FIGURE 1
OCCUPATIONAL INTEREST INVENTORY FOR HIGHER EDUCATION FORM A, MALES

profiles which support the overall contention that there are profiles of attraction (presence in the O-type) and avoidance (absence from the O-type) for each curricular group.

D. DISCUSSION

Interest measurement in this study is based on those job titles and job descriptions that are found in the *Occupational Interest Inventory for Higher Education* (4). This is a recently published inventory which has grown out of more than 12 years of research at Temple University. This study represents the culmination of the interest measurement research with the application of the most advanced methods of computer technology. As far as can be determined, it is the first time that a complete factor analysis of all of the items in any interest inventory has been accomplished. This inventory differs from the better known Kuder and Strong inventories in response format and item content. With regard to the implementation of the statistical approach, the BC TRY system provides the most sophisticated techniques for profile analysis in that it takes into account all of the criteria for evaluating profiles: *viz.*, mean of the scores; scatter, measured by the deviation within the profile; and shape of the particular profile. The O-analysis is a unique procedure of grouping together individuals who have similar profile patterns.

Heretofore, this technique has been applied to achievement and personality measurement. The innovative psychometric study of Tryon (12) was performed on the Holzinger and Swineford (5) achievement data from 301 grade-school children who had responded to 24 paper and pencil tests. After scoring the persons on four dimensions resulting from the V-analysis, Tryon found 14 core O-types. The personality instrument which was analyzed by Tryon (13) was the Minnesota Multiphasic Personality Inventory. His sample was composed of 90 army officers (so-called normals), 70 psychotics, and 150 outpatients from the Veterans' Administration. The V-analysis resulted in seven dimensions (e.g., body symptoms, suspicion), but because of limitations of the computer system employed at that time, only four dimensions could be used in the O-analysis. First, by means of the condensation method, 21 O-types resulted. With application of the technique of hierarchical condensation, the final number of core O-types was reduced to 14.

Further research is in progress to study the characteristics of people who "fit" a particular interest O-type. An initial study (7) indicated that there were personality patterns which characterized certain persons who had been grouped together on the basis of similarity of interest inventory profiles. In addition, the Temperament Survey (3) is being factor analyzed in order to determine the V-dimensions present in the inventory for both college males and females. Also, the college curricular groups are being studied in terms of their factored score patterns, as well as on new empirical keys, with a view toward further validating the results of the variable (V) and object (O) analyses.

REFERENCES

1. FROUNFELKER, G. A. A factor analysis of the basic interest patterns of 200 male liberal arts college juniors and seniors in various majors. Unpublished Doctoral dissertation, Temple University, Philadelphia, Pennsylvania, 1962.
2. HACKMAN, R. B. The problem of vocational choice in vocational guidance: An essay. In J. F. Adams (Ed.), *Counseling and Guidance: A Summary View*. New York: MacMillan, 1965. Pp. 233-248.
3. HACKMAN, R. B., & KEAT, D. B. Temperament Survey (res. ed.). Philadelphia: Authors, 1966.
4. HACKMAN, R. B., KEAT, D. B., & SILVERMAN, E. H. Occupational Interest Inventory for Higher Education. Philadelphia: Psychol. Serv. Center Phila., 1967.
5. HOLZINGER, K. J., & SWINEFORD, F. A Study in Factor Analysis: The Stability of a Bi-factor Solution. Supplemental Monograph No. 48. Chicago: Univ. Chicago Press, 1939.
6. KEAT, D. B. Cluster analysis of inventory items and persons' profiles by means of the BC TRY system. *Proc. 76th Ann. Conv. A.P.A.*, 1968, 3, 201-202.
7. KEAT, D. B., & HACKMAN, R. B. The relationship of interest inventory profiles to

- measures of work motivation among college males. *Proc. 77th Ann. Conv. A.P.A.*, 1969, 4, 179-180.
8. ———. A method of clustering persons' profiles for counseling. *Meas. & Eval. in Guid.*, 1972, 5, 373-378.
 9. THOMPSON, O. E. Impact of commitment upon performance of college students. *Person. & Guid. J.*, 1966, 44(5), 503-506.
 10. TRINKAUS, W. K. The permanence of vocational interests of college freshmen. *Educ. Psychol. Meas.*, 1954, 14, 641-646.
 11. TRYON, R. C. Cluster Analysis. Ann Arbor, Michigan: Edwards, 1939.
 12. ———. Unrestricted cluster and factor analysis, with applications to the MMPI and Holzinger-Harman problems. *Mult. Behav. Res.*, 1966, 1(2), 229-244.
 13. ———. Predicting individual differences by cluster analysis: Holzinger abilities and MMPI Personality attributes. *Mult. Behav. Res.*, 1967, 2(3), 325-348.
 14. TRYON, R. C., & BAILEY, D. E. The BC TRY computer system of cluster and factor analysis. *Multi. Behav. Res.*, 1966, 1(1), 95-111.
 15. ———. Cluster Analysis. New York: McGraw-Hill, 1970.
 16. WHERRY, R. J., & WINER, B. J. A method for factoring large numbers of items. *Psychometrika*, 1953, 18, 161-179.

Department of Counselor Education
The Pennsylvania State University
323 Social Science Building
University Park, Pennsylvania 16802

LOCUS OF CONTROL AND ACHIEVEMENT—THE CONFIRMATION OF A THEORETICAL EXPECTATION*¹

Emory University

MARSHALL P. DUKE AND STEPHEN NOWICKI

SUMMARY

In an attempt to assess the relationship between locus of control and achievement, a newly developed locus of control (ANSIE) scale was administered to 48 Ss. Internality was related to high achievement for males, and externality for females. This unexpected result was replicated in two further studies. As in the past the Rotter I-E scale did not correlate with achievement. Results were discussed from a cultural role expectancy point of view.

A. INTRODUCTION

An internal locus of control orientation has been shown to be positively related to greater achievement in children, although admittedly the results are more consistent for males than females (3, 4, 14, 17). The locus of control/achievement for adults, mostly involving the Rotter (19) scale, has by comparison, been less impressive. Rotter has offered at least two reasons why the achievement/locus of control relation might not occur. One is that, among college males, there may be defensive externals or students who were originally competitive, but who use externality as a shield against failure. The second is that "internal-external control attitudes are obviously not generalized across the board and in the highly structured academic achievement situation there is probably more specificity determining responses than in other kinds of situation" (19, p. 4).

It is the present authors' contention that yet a third reason for the lack of significant relation to achievement may be added, this being possible deficiencies in the locus of control measure itself. Although the historical significance of the Rotter scale cannot be denied, it has recently received

* Received in the Editorial Office on May 6, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Requests for reprints should be sent to the first author at the address shown at the end of this article.

significant criticism. For one thing Rotter I-E scores have shown a consistent and significant relationship to social desirability responding and to the denial of psychopathology (1, 2, 5, 6, 7, 11, 12). For another, Rotter I-E items confound personal, social, political, and ideological causation (8, 9, 20, 21). Last, the scale's forced choice format and difficult reading level may make it inappropriate for *noncollege* populations (15).

Nowicki and Duke (16) have presented a new scale for adults, the Nowicki-Strickland locus of control scale (ANSIE) which is a parallel form of the children's Nowicki-Strickland scale—CNSIE (17). The scale was constructed in such a way as to avoid the difficulties associated with the Rotter scale. (Specific characteristics of the ANSIE are included below.)

If the measure of locus of control is the source of the failure to find in adults a relation between locus of control and achievement, a reassessment of the relationship utilizing a measure designed to overcome the limitations of Rotter seemed appropriate. It could be hypothesized from the notion of internal-external control and previous findings with younger subjects that internality is related to greater achievement. While this may be true for males, past results suggest that one cannot be so certain about the relationship for females. One is left with the impression that almost any relationship could be expected. Because of this, the authors have fallen back on social learning theory as a predictive base, hypothesizing that, if indeed a relationship can be found, internality should be positively related to academic achievement.

B. METHOD

1. Subjects

Twenty-two males and 26 females (juniors in a medium sized university in the southeastern United States) were asked to complete the Rotter and ANSIE scales; grade point average and SAT scores were obtained from school records.

2. Measures

The ANSIE consists of 40 items which are answered either *yes* or *no*. The items were derived through modification of the CNSIE (17). These alterations consisted chiefly of changing the word "children" to "people" ($n = 6$) and changing the tense of some statements to make them more appropriate for adults ($n = 5$). An example of an item is "Do you think that people can get their own way if they just keep trying?" The construction of items for the CNSIE was based on Rotter's definition of the locus

of control dimension (19, p. 1). For items to be acceptable for the CNSIE scale, they had to have a reading difficulty no higher than the fifth grade level. For further information of item selection for the CNSIE the reader is referred to Nowicki and Strickland (17). Split-half reliabilities range from .74 to .86, indicating that the test has satisfactory internal consistency. For college subjects ($n = 48$), test-retest reliability for a six-week period was $r = .83$, indicating ANSIE scores are stable over time. Consistent with the requirements of construct validity assumptions, ANSIE scores were not related to scores from a social desirability measure (Marlowe-Crowne social desirability scale, $r = .06$, $df = 67$ in a sample of college students).

The Rotter I-E scale was that developed by Rotter and his associates at Ohio State (13). The scale is supported by considerable evidence of reliability and construct validity (19).

C. RESULTS AND DISCUSSION

Data were analyzed via correlational procedures, and the results are shown in Table 1. The scores on neither measure were related to a more general measure of aptitude, SAT scores. As can also be seen, the hypothesized relation for locus of control and achievement is supported for males with the ANSIE, but for neither males nor females with the Rotter scale. That is, internality for males is positively related to achievement when ANSIE scores are used as a measure of locus of control. In addition, it was also found that *externality* on the ANSIE was significantly related to achievement for females, which is consistent with a cultural role interpretation. This suggests that college-aged females are more likely than males to adopt an expressed external orientation to be congruent with the expected female cultural role of passivity. Expressing an internal locus of control orientation presents a social relationship dilemma for females generally, and females in competitive-achievement situations involving men, specifically. These difficulties may eventually result in what Horner (10) has called "fear of success" in women. That is, by succeeding and accepting the responsibility for their success, young women are in essence threatening men. This, in turn, may be perceived as lessening their chances for successful social interaction with these same men.

Noting these contingencies, a truly internal female may express an external orientation, feeling that it is more useful for her purposes to express conformity (to the expected female role) and to disavow any responsibility for her supposed internal appearing behavior. That is, a truly internal female may use her verbally expressed externality to obtain what she wants. If this

TABLE 1
CORRELATIONS FOR THE TWO MEASURES OF LOCUS OF CONTROL AND
CORRELATIVE VARIABLES OF MALE AND FEMALE COLLEGE STUDENTS

Measure	Rotter		Nowicki-Strickland	
	Male (<i>n</i> = 22)	Female (<i>n</i> = 26)	Male (<i>n</i> = 22)	Female (<i>n</i> = 26)
GPA ^a	-.05	.18	-.50**	.39*
SAT ^b	-.10	.00	-.01	-.15

^a Cumulative grade point average.

^b Scholastic Aptitude Test.

* $p < .05$.

** $p < .02$.

is the case, locus of control could be differentially predictive for males and females, with high achievement tending to be related to expressed externality in females and internality in males. To investigate whether or not these somewhat surprising results were spurious, two additional studies were conducted by the authors and their students.

In the first study, Pappas and Nowicki (18) used college students from an introductory psychology class and found the same significant set of relationships between locus of control as measured by the ANSIE and achievement (females, $r = .63$, $df = 38$, $p < .01$; males, $r = -.48$, $df = 36$, $p < .01$). Once again locus of control scores were found not to be related to SAT scores. In the second study, the present authors used college sophomores from an introductory psychology class and found a similar set of relationships (females, $r = .42$, $df = 26$, $p < .05$; males, $r = -.42$, $df = 24$, $p < .05$).

On the basis of these three studies, it is tentatively concluded that this differential relationship is a stable one and is consistent with the notion that externality may be a more culturally approved role for females than for males, and that within a group of verbally expressed external females (as measured by responses to the ANSIE) there may be a large number of internally behaving females (as reflected by academic achievement behavior). This, in turn, suggests that when investigating achievement behavior in females, one may have to adopt more complex models involving mediational variables.

REFERENCES

1. ALTROCCHI, J., PALMER, J., & DAVIS, H. The Marlowe-Crowe repressor-sensitizer, and internal-external scales and attribution of unconscious hostile intent. *Psychol. Rep.*, 1968, 23, 1229-1230.
2. CONE, J. D. Locus of control and social desirability. *J. Consult. & Clin. Psychol.*, 1971, 36, 449.

3. CRANDALL, V. C., KATKOVSKY, W., & CRANDALL, V. J. Children's beliefs in their own control of reinforcements in intellectual-academic achievement situations. *Child Devel.*, 1965, **36**, 91-109.
4. CRANDALL, V. J., KATKOVSKY, W., & PRESTON, A. Motivational and ability determinants of young children's intellectual achievement behaviors. *Child Devel.*, 1962, **33**, 643-661.
5. FEATHER, N. T. Some personality correlates of external control. *Australian J. Psychol.*, 1967, **19**, 253-260.
6. GOLD, D. Some correlation coefficients: Relationships among I-E scores and other personality variables. *Psychol. Rep.*, 1968, **22**, 983-984.
7. GOSS, A., & MOROSKO, T. E. Relation between a dimension of internal-external control and the MMPI with an alcoholic population. *J. Consult. & Clin. Psychol.*, 1970, **34**, 189-192.
8. GURIN, P., GURIN, G., LAO, R. C., & BEATTIE, M. Internal-external control in the motivational dynamics of Negro youth. *J. Soc. Issues*, 1969, **25**, 29-53.
9. HJELLE, L., & FINK, C. Locus of control and political ideation. *Psychol. Rep.*, 1974, in press.
10. HORNER, M. A bright woman is caught in a double-bind: In achievement-oriented situations she worries not only about failure but also about success. *Psychol. Today*, 1972, Jan., 36-38, 61.
11. JOE, V. C. Review of internal-external control construct as a personality variable. *Psychol. Rep.*, 1971, **28**, 619-640.
12. LEFCOURT, H. M., & WINE, J. Internal versus external control of reinforcement and the deployment of attention in experimental situations. *Can. J. Behav. Sci.*, 1969, **1**, 167-181.
13. LIVERANT, S., ROTTER, J. B., & CROWNE, D. O. Unpublished observation. See Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, **80**(1), Whole No. 609.
14. MCGHEE, P. E., & CRANDALL, V. G. Beliefs in internal-external control of reinforcement and academic performance. *Child Devel.*, 1968, **39**, 91-112.
15. NOWICKI, S. Difficulty levels of locus of control scales. An unpublished manuscript, Emory University, Atlanta, Georgia, 1972.
16. NOWICKI, S., & DUKE, M. A locus of control scale for college as well as noncollege adults. *J. Personal. Assess.*, 1974, in press.
17. NOWICKI, S., & STRICKLAND, B. R. A locus of control scale for children. *J. Consult. & Clin. Psychol.*, 1973, **40**, 148-154.
18. PAPPAS, C., & NOWICKI, S. Achievement correlates of locus of control. Paper presented at the Southeastern Psychological Association meetings, Atlanta, Georgia, 1972.
19. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, **80**(1), Whole No. 609.
20. SILVERN, L., & NAKAMURA, C. Y. Powerlessness, social-political action, social-political views: Their interrelation among college students. *J. Soc. Issues*, 1971, **27**(4), 137-157.
21. THOMAS, L. E. The I-E scale, ideological bias, and political participation. *J. Personal.*, 1970, **38**, 273-286.

Department of Psychology
Emory University
Atlanta, Georgia 30322

SOME CORRELATES OF MEHRABIAN'S SCALES OF AFFILIATIVE TENDENCY AND SENSITIVITY TO REJECTION*¹

University of Port Elizabeth, South Africa

D. J. W. STRÜMPFER

SUMMARY

Assessment of approach and avoidance aspects of affiliation motivation was reviewed. Ss were 60 white male university students. Split-half reliabilities were .71 and .60. Convergent and divergent aspects of validity were investigated in terms of self-report measures. Scales that correlated significantly with Affiliative Tendency converged meaningfully in terms of both contents and intercorrelations; those with nonsignificant correlations could also have been expected to diverge. For Sensitivity to Rejection, convergent and divergent patterns appeared but were less clear. The two scores were summed to obtain a Dependency score, which showed meaningful correlations, too. Affiliative Tendency increased with increasing ordinal position.

A. INTRODUCTION

Studies of social motives quite early on yielded evidence that Miller's (18) concepts of approach and avoidance should be considered in connection with each motivational area. The first studies on achievement motivation by McClelland, Atkinson, Clark, and Lowell (13) provided evidence of hope of success and fear of failure components. With respect to affiliation motivation, French and Chadwick (9) found that it could be either goal- or threat-oriented; this finding was followed up by de Charms (6) who found that the approach and avoidance components had different behavioral correlates. Subsequently the approach-avoidance distinction formed the basis of Mehrabian and Ksionzky's (17) theoretical models for affiliative, dependency, and conformity behaviors; they distinguished between the two general expecta-

* Received in the Editorial Office on May 7, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The author wishes to express appreciation to the Research Committee, University of Port Elizabeth, for a grant in support of this study; to Mr. P. B. Hotz who was his research assistant and tested the Ss; to Dr. A. Mehrabian and Mr. H. C. Marais for comments on a first draft.

tions, that interactions with others will be either positively or negatively reinforcing.

Assessment of these dimensions has presented problems. The original procedure for the measurement of affiliation motivation was to score projective stories by means of the Heyns, Veroff, and Atkinson (11) scoring manual. It was this total score that de Charms (6) divided into approach and avoidance components. However, Fishman (8) found that the approach component contributed almost exclusively to the predictive value of the total score and suggested that it might be more economical to score only the approach component. Mehrabian and Ksionzky (17) mentioned factor analyses of the scoring categories of the thematic measure, which yielded two factors defined by the positive and negative scores. Mehrabian (16), however, reported that these factors "did not relate to anything in any significant or meaningful way."

Another projective procedure was introduced by Byrne, McDonald, and Mikawa (2) who scored stories for interpersonal affect. "Positive Affect" was the approach component in their system. However, "Negative Affect" was not the fear of rejection (avoidance) component of affiliation motivation; rather it should be considered as a measure of what Murray (19) called "need for aggression," since it "is scored if the relationship between characters in the story is explicitly or implicitly characterized by dislike, interpersonal hostility or anger, resentment, ridicule, fights, quarrels, physical violence, murder, or simply the desire to be apart" (2, p. 24). Four stories were each scored either positive or negative, and on the basis of the positive-negative ratio an *S* was placed into approach, avoidance, mixed, or unmotivated groups. However, to infer avoidance motivation from aggression scores does not seem to be a parsimonious procedure.

The model for an alternative assessment procedure was provided in the achievement area by Atkinson and Litwin (1) who measured hope of success by means of a projective technique, fear of failure by means of a test anxiety questionnaire, and combined the two into a resultant achievement motivation score. Rosenfeld (22) introduced this procedure into the affiliation area by using the Heyns *et al.* (11) method to assess the need for affiliation (approach) component and fear of rejection by means of a questionnaire which he constructed for this purpose.

The above-mentioned studies which reveal the dual nature of the total Heyns *et al.* score tend to mark such a procedure as unsound: it does not seem psychometrically sensible to use a total score contaminated by avoidance elements to represent the approach dimension.

Another dubious aspect of the Rosenfeld type of assessment is that projective and self-report measures often tap dissimilar psychological contents which ought not to be combined into a resultant score. On projective measures the *S* tends unknowingly to reveal unconscious, dynamic material; by contrast, the high visibility of the contents of self-report procedures produces responses that represent largely the *S*'s conscious perceptions of reality, perhaps partially distorted by response sets.

With respect to the choice between projective and self-report measures, Carney (3, p. 679) reasoned that "unless we are specifically interested in the reactions of an *S* to the total test context (as we well may be in clinical practice) we are better off to control that context"; this, however, requires "a vigorous and detailed definition of every significant facet of that context," which is ordinarily both time-consuming and expensive. This tends to favor self-report measures which, if done well, largely eliminate personal interaction and other situational influences from the testing situation. In addition, they are much less laborious to administer and score, lending themselves easily to computer scoring, too.

Against this background, Mehrabian's (15) self-report scales of "Affiliative Tendency" (AT) and "Sensitivity to Rejection" (SR) provide a clear alternative assessment procedure. These scales were developed in terms of the Mehrabian and Ksionzky (17) theoretical exposition. They contain, respectively, 31 and 38 items, answered on a scale ranging from -4 to $+4$. Mehrabian (15) reported test-retest reliabilities of .89 and .92 for the two scales, a nonsignificant correlation between them, as well as encouraging indications of validity in terms of behavioral criteria. He also found support for the hypothesis that Dependency (Dep) is the sum of Affiliative Tendency and Sensitivity to Rejection, as proposed by him and Ksionzky.

The present study investigated convergent and divergent aspects of the validity of the Mehrabian measures in terms of a variety of other self-report measures. Their relationship to a number of biographical variables was also investigated.

B. METHOD

Sixty white male university students volunteered for about three hours of paid testing in a larger project, in response to advertisements on campus and in residences. Their mean age was 22.00 years ($SD = 1.75$; range: 19-29), and their mean number of years of formal education completed was 15.00 ($SD = 2.45$; range: 12-20). Arts, Science, Law, Commerce, and Education students were included.

In addition to the AT and SR scores, a Dep score was obtained by converting AT and SR to standard scores and summing them. (The r between AT and Dep was .71, and between SR and Dep .53.)

The following inventories were used as criterion measures: Jackson (12) Personality Research Form AA (PRF); Rotter (23) Internal-External Locus of Control Scale; Rokeach (21) Dogmatism Scale; Crowne-Marlowe (5) Social Desirability Scale; and Couch-Keniston (4) Agreement Response Tendency Scale. Some biographical information was requested, but Ss were given the choice to remain anonymous, which 22 of them did.

C. RESULTS

The AT mean was 16.67 ($SD = 25.95$), and the SR mean was 3.25 ($SD = 21.62$). The uncorrected split-half reliabilities of the two scales were .61 and .43, respectively, which became .71 and .60 after Raju-Guttman (20) correction (.75 and .60 after Spearman-Brown correction). The product-moment correlation (r) between the two scales was $-.22$ (not significant).

1. Response Sets

Table 1 shows the r s between the Mehrabian scores and three response set scores; PRF Infrequency showed only nonsignificant r s. Table 1 also shows the Raju-Guttman corrected split-half reliabilities of the response set scales; since those of the PRF Desirability and Agreement Response scales were so low, their correlations have to be viewed with some hesitation. Dep's resistance to response sets resulted from the fact that the r s of AT and SR with the response set scales had opposite signs, so that they cancelled each other out in Dep; this seems to be an advantage of Dep over its components. (Social Desirability had r s of .34 and $-.38$ with PRF Desirability and Agreement Response, and these two an r of $-.42$.)

2. Construct Validation

Table 1 also shows the r s of AT, SR, and Dep with other scales for all instances where at least one of the three showed a significant r , as well as the Raju-Guttman reliabilities of these criterion scales.

In terms of Jackson's (12) descriptions of the scales which showed significant r s with *Affiliative Tendency*, a high scorer on it could be described as tending to do the following (in decreasing order of size):

To accept people readily, to make efforts to win friendships, and to enjoy being with friends and people in general (Affiliation).

TABLE 1
CORRELATIONS OF MEHRABIAN SCORES WITH OTHER SCALES

Scale	Reliability	Affiliative Tendency (AT)	Sensitivity to Rejection (SR)	Dependency (Dep)
Response sets				
Social Desirability (5)	.65	.15	— .30*	— .12
PRF Desirability (12)	.46	.32*	— .22	.08
Agreement Response (4)	.49	— .05	.35**	— .13
Jackson PRF (12)				
Achievement	.64	— .12	— .29*	— .33**
Affiliation	.83	.75***	— .22	.43***
Autonomy	.74	— .34**	— .28*	— .50***
Change	.73	.32*	— .40**	— .07
Dominance	.77	— .04	— .29*	— .27*
Endurance	.75	— .03	— .37**	— .32*
Exhibition	.76	.37**	— .28*	.08
Harmavoidance	.80	— .26*	.32*	.05
Impulsivity	.65	.33**	— .09	.19
Nurturance	.85	.30*	— .31*	— .01
Play	.64	.52***	— .06	.37**
Sentience	.67	.16	— .30*	— .11
Social Recognition	.81	.14	.23	.30*
Succorance	.78	.48***	.13	.49***
Locus of Control (23)	.79	— .17	.28*	.09
Dogmatism (21)	.84	— .26*	.15	— .09

* $p < .05$.

** $p < .01$.

*** $p < .001$.

To do many things just for fun and to enjoy games, sports, social activities, humor, and light-heartedness (Play).

To seek sympathy, protection, love, advice, and reassurance from others, and to feel insecure without such support (Succorance).

To behave in ways which win the notice of others (Exhibition).

To conform and to seek attachments (Autonomy).

To act without deliberation and to express feelings readily (Impulsivity).

To adapt his opinions and values to the circumstances he finds himself in (Change).

To give assistance, care, comfort, and sympathy to others (Nurturance).

To be adventurous (Harmavoidance).

Also to be tolerant and open-minded [Dogmatism (21)].

Of course, not all of these r s represented independent relationships to AT. The r s between Affiliation and the other scales were quite similar to those of AT with the other scales shown in Table 1, except that its r with Change just missed significance.

One way of viewing these intercorrelations of the scales that showed significant r s with AT is in terms of the factors found by Edwards, Abbott, and Klockars (7). Change, Impulsivity, and Harmavoidance all loaded highly on their Factor I; in the present study their inter- r s were all highly significant. A second group was Affiliation, Autonomy, Nurturance, and Succorance which had high loadings on Factor II; in the present study the r s of Nurturance with Autonomy and Succorance were nonsignificant, but their other inter- r s were significant. Exhibition and Play each loaded on separate factors; in the present study Exhibition showed significant r s with Impulsivity, Play, and Succorance, while Play also had a significant r with Impulsivity. Among the remaining inter- r s the only other significant ones were those of Dogmatism with Play and Succorance. The pattern of inter- r s found in the present study was also quite similar to that reported by Jackson (12) for the same PRF scales.

On the grounds of both their psychological content and their inter- r s, the scales that correlated significantly with AT thus seem to converge meaningfully. From a discriminant point of view, the scales that had nonsignificant r s with AT do not represent constructs that could be related to AT on deductive grounds: viz., Abasement, Achievement, Aggression, Cognitive Structure, Defendance, Dominance, Endurance, Order, Sentience, Social Recognition, and Understanding.

When Jackson's descriptions of the scales that showed significant r s with *Sensitivity to Rejection* (Table 1) are considered, it could be said that an S with a high SR score tends to do the following (in decreasing order of size):

To prefer routine above new experiences, not to adapt readily to changes of environment, and to be averse to changing his mind (Change).

To give up easily or to be perfunctory in his work habits (Endurance).

To maximize personal safety (Harmavoidance), which is reminiscent of Schachter's (24) S s' affiliative tendencies under threat.

To shy away from nurturant interaction with others, and especially with dependent people (Nurturance).

To be relatively insensitive to many forms of sensual experience (Sentience).

To have a low need for achievement (Achievement).

To be submissive (Dominance).

To conform and to seek attachment to people, places, and obligations (Autonomy).

To avoid the notice of others (Exhibition).

Also to perceive events in life as the result of chance, fate, or under the control of powerful others [Locus of Control (23)].

Again, all of these *rs* did not represent independent relationships with SR. However, in terms of the Edwards *et al.* (7) factors, the pattern of inter-correlations of those scales that correlated significantly with it was rather diffuse. The following pairs of scales loaded on a factor each: Change and Harmavoidance, Autonomy and Nurturance, Exhibition and Dominance, Achievement and Endurance, leaving Sentience in still another factor. In the present study Change and Harmavoidance, as well as Achievement and Endurance, showed high correlations, but not Autonomy and Nurturance, or Exhibition and Dominance. The following inter-*rs* were also significant (in alphabetical order): Achievement with Nurturance and Sentience (as well as Dogmatism); Change with Sentience; Dominance with Endurance, Exhibition, and Nurturance; Endurance with Nurturance (and Dogmatism); and Nurturance with Sentience. Although the psychological interpretations of these scales could be pulled together speculatively, their inter-*rs* were confusing.

In consideration of the scales that showed nonsignificant *rs* with SR, one could on *a priori* grounds have expected significant *rs* in the case of Defence (defensive, suspicious, does not accept criticism readily) and Social Recognition (need for esteem, concerned about approval and reputation). From a discriminant point of view, the remaining nonsignificant *rs* with SR were to be expected: viz., with Abasement, Affiliation, Aggression, Cognitive Structure, Impulsivity, Order, Play, Succorance, and Understanding.

In general, the patterns of *r* of AT and SR with the other scales seem to indicate that Mehrabian has reached one of his goals in the construction of these scales, that "one measure should not simply yield relationships which are the converse of those obtained with the other" (15, p. 418).

In the validation of *Dependency*, the especially meaningful *rs* were those with Autonomy, Succorance, Achievement, and Social Recognition (in decreasing order of size), since Dep showed higher *rs* with them than did its two components. Since both AT and SR had significant *rs* with Autonomy, the *r* between Dep and Autonomy was the most important of these four. As constructs, dependency and autonomy are the reverse of each other, so that the high negative *r* confirmed Mehrabian and Ksionzky's (17) deduction, that dependency is the sum of affiliative tendency and sensitivity to rejection.

Since the *r* between SR and Succorance was nonsignificant, the argument for the *r* between Dep and Succorance is weaker; however, dependency is

readily reconcilable with an image of frequently seeking sympathy, protection, love, advice, and reassurance, and of feeling insecure or helpless without it.

In the case of Achievement, AT had a nonsignificant r , but again the low need for achievement implied by the r between Dep and Achievement was meaningful. Mehrabian (15) reported r s of AT and SR with his Resultant Achievement Motivation scale (14) which had the same implication for Dep as the present ones.

The case of Social Recognition is also of interest, since its r s with AT and SR were both nonsignificant, but their additive interaction caused the r with Dep to be significant. Jackson's (12) description of high social recognition scorers as desirous of high esteem by acquaintances, as concerned about their reputation and what others think of them, and as willing to work for the approval and recognition of others, again seems to fit the dependency image.

Lastly, those scales whose nonsignificant r s with Dep did not result from cancellation effects between AT and SR could be considered: viz., Abasement, Aggression, Cognitive Structure, Defence, Order, and Understanding. On theoretical grounds, one would expect all of them to be uncorrelated with Dep.

3. *Biographical Correlates*

Fifty Ss indicated their fathers' occupations, which were rated on Hall and Jones's (10) seven-point scale; the mean was 2.56 ($SD = 1.18$; range: 1-5). None of the Mehrabian scores showed a significant r with the fathers' occupational level. For 54 Ss the fathers' mean number of years of completed education was 13.67 ($SD = 3.48$; range: 8-21) and for mothers 12.23 ($SD = 2.20$; range: 8-20); fathers' and mothers' education, as well as their sum, all had nonsignificant r s with the Mehrabian scores. Finally, the mean family size was 2.78 ($SD = 1.04$; range: 1-5), and its r s with the three scores were also nonsignificant.

In view of the large number of studies on affiliative motivation and birth order in the past, one-way analyses of variance were done on the three Mehrabian scores to compare the single, firstborn, middle, and last born Ss (n s = 6, 22, 12, and 10, respectively); single and firstborn Ss were kept separate on account of Warren's (24) indications. Significant F values were obtained for all three scores: viz., 33.46 for AT ($p < .01$), 3.66 for SR ($p < .05$), and 5.47 for Dep ($p < .01$). The Scheffé test was used to compare the separate means. In the above sequence, the AT means were as follows: 18.66,

9.50, 14.83, and 18.60. The firstborns had a significantly *lower* mean than only, middle, and youngest children (all $p < .01$), while the difference between middle and last borns was also significant ($p < .05$). This means that, with increasing ordinal position, there was also an increasing general expectation of a positive reinforcing quality of others for the S. On SR the means were as follows: —4.50, 4.50, 1.75, and 6.10; none of the differences between the separate means was significant. The four Dep means were as follows: —.0233, —.2164, —.1392, and .1250. Only the difference between first- and last borns was significant ($p < .01$); i. e. the firstborns reported a greater approach-avoidance tendency towards others than last borns. In part, this confirmed Mehrabian and Ksionzky's (17) summary of previous findings about the greater dependency of firstborns. A study on larger samples to investigate the relationships between these three scores and family constellation variables is in progress.

REFERENCES

1. ATKINSON, J. W., & LITWIN, G. H. Achievement motive and test anxiety conceived as motive to approach success and motive to avoid failure. *J. Abn. & Soc. Psychol.*, 1960, **60**, 52-63.
2. BYRNE, D., McDONALD, R. D., & MIKAWA, J. Approach and avoidance affiliation motives. *J. Personal.*, 1963, **31**, 21-37.
3. CARNEY, R. E. The effect of situational variables on the measurement of achievement motivation. *Educ. & Psychol. Meas.*, 1966, **26**, 675-690.
4. COUCH, A., & KENISTON, K. Yeasayers and naysayers: Agreeing response set as a personality variable. *J. Abn. & Soc. Psychol.*, 1960, **60**, 151-174.
5. CROWNE, D. P., & MARLOWE, D. The Approval Motive. New York: Wiley, 1964.
6. DE CHARMS, R. Affiliation motivation and productivity in small groups. *J. Abn. & Soc. Psychol.*, 1957, **55**, 222-226.
7. EDWARDS, A. L., ABBOTT, R. D., & KLOCKARS, A. J. A factor analysis of the EPPS and PRF personality inventories. *Educ. & Psychol. Meas.*, 1972, **32**, 23-29.
8. FISHMAN, D. B. Need and expectancy as determinants of affiliative behavior in small groups. *J. Personal. & Soc. Psychol.*, 1966, **4**, 155-164.
9. FRENCH, E. G., & CHADWICK, I. Some characteristics of affiliation motivation. *J. Abn. & Soc. Psychol.*, 1956, **52**, 296-300.
10. HALL, J., & JONES, D. C. Social grading of occupations. *Brit. J. Sociol.*, 1950, **1**, 31-55.
11. HEYNS, R. W., VEROFF, J., & ATKINSON, J. W. A scoring manual for the affiliation motive. In J. W. Atkinson (Ed.), *Motives in Fantasy, Action and Society*. Princeton, N. J.: Van Nostrand, 1958.
12. JACKSON, D. N. Personality Research Form Manual. Goshen, N. Y.: Res. Psychol. Press, 1967.
13. MCCLELLAND, D. C., ATKINSON, J. W., CLARK, R. A., & LOWELL, E. L. The Achievement Motive. New York: Appleton-Century-Crofts, 1953.
14. MEHRABIAN, A. Male and female scales of the tendency to achieve. *Educ. & Psychol. Meas.*, 1968, **28**, 493-502.
15. ———. The development and validation of measures of affiliative tendency and sensitivity to rejection. *Educ. & Psychol. Meas.*, 1970, **30**, 417-428.

16. ———. Personal communication, 1970.
17. MEHRABIAN, A., & KSIONZKY, S. Models for affiliative and conformity behavior. *Psychol. Bull.*, 1970, **74**, 110-126.
18. MILLER, N. E. Experimental studies of conflict. In J. McV. Hunt (Ed.), *Personality and the Behavior Disorders (Vol. 1)*. New York: Ronald, 1944.
19. MURRAY, H. A. Explorations in Personality. New York: Oxford, 1938.
20. RAJU, N. S., & GUTTMAN, I. A new working formula for the split-half reliability model. *Educ. & Psychol. Meas.*, 1965, **25**, 963-967.
21. ROKEACH, M. The Open and Closed Mind. New York: Basic Books, 1960.
22. ROSENFELD, H. M. Social choice conceived as a level of aspiration. *J. Abn. & Soc. Psychol.*, 1964, **68**, 491-499.
23. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.* 1966, **80**(1), Whole No. 609.
24. SCHACHTER, S. The Psychology of Affiliation: Experimental Studies of the Sources of Gregariousness. Stanford, Calif.: Stanford Univ. Press, 1959.
25. WARREN, J. R. Birth order and social behavior. *Psychol. Bull.*, 1966, **65**, 38-49.

Subject Committee of Psychology

University of Port Elizabeth

P.O. Box 1600

Port Elizabeth, South Africa

PHOTOGRAPHIC IMAGERY AND THE VIETNAM WAR: AN UNEXAMINED PERSPECTIVE*¹

The Ohio State University

KENRICK S. THOMPSON AND ALFRED C. CLARKE

SUMMARY

This study, contrasting the simultaneous approaches of two professional photojournalists in reporting events occurring during the Vietnam war, focuses upon the effects of photographic imagery on individuals' inclinations to believe emotionally charged communications within the mass media. The data show that the portrayals of the Vietnam war by David Douglas Duncan and by Larry Burrows are significantly different. Content analysis of Duncan's photographic imagery demonstrates his monolithic dedication to the American soldier, and his sense of commitment to demonstrate the burdens placed on military men. In contrast, Burrows' photographic images express his pronounced concern for the nonmilitary and the human consequences of a wartime situation. The present investigators believe that the sociological and the social psychological significance of photographic imagery have yet to be fully realized and understood. Differential emphases of visual forms of communication, which are demonstrated in this analysis, may be inferred to have potentially powerful influences on the opinions, attitudes, and belief systems of members of the viewing public. In a photoelectronic age, where interpretation of events based on imagery takes on special significance, it may be particularly fruitful for social scientists to employ visual methods of research in studying modern social problems.

A. INTRODUCTION

A new reality that has emerged from the processes of social change is that increasingly larger numbers of persons are primarily dependent upon the mass media for knowledge of current events—local, national, and international. This observation is especially significant in reference to the present

* Received in the Editorial Office on May 9, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This paper will be presented to the Visual Sociology Section at the annual meeting of the American Sociological Association, Montreal, Canada, August 1974.

inquiry into the content of war-related imagery. Information available to most Americans about the war in Vietnam was necessarily acquired indirectly. American citizens who were not there could not see the unfolding events. In an age of credibility gaps and kaleidoscopic change, many individuals were admittedly skeptical of certain verbally described events concerning the war until they were able to view photographic accounts of them. Comments by McLuhan (8) about the significance of visual imagery in communication seem particularly relevant to these reactions:

Most people find it difficult to understand purely verbal concepts. They *suspect* the ear; they don't trust it. In general we feel more secure when things are *visible*, when we can "see for ourselves. . . ."

We employ visual and spatial metaphors for a great many everyday expressions. . . . We are so visually biased that we call our wisest men *visionaries*, or *seers* (p. 117).

The average person relies on and trusts the veridicality of most of what he sees, either directly, or through the photographic medium. This has been aptly summarized by Baker (1): "It is estimated that 80 percent of all impressions are received through the eyes. The American way of life encourages this phenomenon. . . . The fact that pictures work subtly [and sometimes insidiously] only increases their power" (p. 1).

It would be difficult to doubt that photographic imagery provides one of the most powerful influences in forming, changing, and molding public opinion, since television and photojournalistic publications bombard the public daily with visual stimuli. The American citizenry had no recourse but to accept published reports of the Vietnam war as valid information. Nevertheless, many Americans remained highly skeptical about what they read and saw in magazines and newspapers, and viewed on television. In view of this skepticism, it is surprising that little research has been directed concerning the effects of photographic imagery on individuals' inclinations to believe emotionally charged communications.

The present study contrasts the approaches of two professional photographers (or photojournalists) in their attempt to depict human experiences and environing circumstances via photographic imagery.² Two internationally

² "Photographic imagery" is employed in this report as the inferred characteristics of an individual's tendencies to perceive, select, and project certain idiosyncratic symbols via the photographic media. Imagery is used to designate the inferred social-psychological correlates and consequences of such projected symbols on the overt reactions and personal experiences of a viewing audience. This conceptual use of imagery is more inclusive than that traditionally implied by American behaviorists; however, present usage is consistent with the theoretical implications in the writings of Carl G. Jung and also with the social-

known photographers, David Douglas Duncan and Larry Burrows, simultaneously covered the Vietnam war. The photographic images that are examined in this study relate exclusively to their visual accounts of that armed conflict. While acting as a photojournalist/war correspondent, Burrows lost his life in a helicopter crash in Laos during 1971. Duncan, the somewhat older of the two photographers, a veteran of numerous military campaigns, is still currently engaged in professional photography. Although the difference in their chronological ages (less than 10 years) was not considered a crucial variable in their photographic accounts of the Vietnam war, variations in some of the prior cultural experiences of Duncan and Burrows are noted in the present report.

B. RESEARCH DESIGN AND PROCEDURES

The purpose of this study was to look for differences in photographic techniques, subject emphases, and quality (nature) of presentations employed by two apparently different photojournalists in their contemporaneous photo-essays about the Vietnam war. In an effort to identify differences between them, the technique of content analysis was employed. Since few methodological guidelines exist in this area, the problem of selecting defensible categories of imagery was ever present both in terms of the lack of a universally acceptable theoretical model and the unavailability of a definitive method for selecting the breadth of "units of content."

As Berelson (2) has observed: "Content analysis stands or falls by its categories. Particular studies have been productive to the extent that the categories were clearly formulated and well adapted to the problem and to the content" (p. 147). Attempts were made in the present study to specify clearly the "image categories" utilized in coding the content data. The categories were constructed around the investigators' primary research question: How do the two photojournalists (Duncan and Burrows) differ in terms of their image portrayals of the Vietnam war?

Content analysis categories were constructed (see Appendix A) on the basis of which 306 images for both photographers were identified and examined. Fifty-seven photographs were available for Burrows from his *Compassionate Photographer* (6). Two hundred and forty-nine images were available from the photographs by Duncan presented in *I Protest* (3) and

psychological guidelines in "modern" geography [for the former, see C. G. Jung (Ed.), *Man and His Symbols*, reprinted by Doubleday, 1964; for the latter, see R. M. Downs & D. Stea (Eds.), *Image and Environment: Cognitive Mapping and Spatial Behavior*. Aldine Press, 1973].

War Without Heroes (4). All photographic images that appeared relevant to the Vietnam war in these three photo-essays, which exhaust the Vietnam coverage in terms of both photographers' published works, were studied and rated. The number of images in Duncan's photojournalistic reports is large when compared to the number for Burrows, a difference partially determined, no doubt, by Burrows' early death. Each available image was subjected to the systematic procedures most commonly employed in content analysis. Relevant categorical classifications were made and recorded. The number and the proportion of images assigned to a given category (or subgroups within a category) are presented in numbers and in percentages of the total number of images for each photographer. In two instances, *a priori* selected categories were combined to yield larger numbers and percentages. This was judged desirable because of the extremely small number of images produced by Duncan in certain categories.

Prior to coding, the data were carefully examined by the investigators in an attempt to identify any idiosyncratic attributes that might bias the findings of the study. After the coding and data analysis were completed, the "face validity" of the quantitative results was examined again by a reassessment of all the photo-essays. The observations of I. de S. Pool (10) served as continuous cautions: "It should not be assumed that qualitative methods are insightful, and quantitative ones merely mechanical methods for checking hypotheses. The relationship is a circular one; each provides new insights on which the other can feed" (p. 192).

C. FINDINGS

As may be seen in Table 1, 43.9 percent of Burrows' photographs were classified as depicting a distinctly combat or likely combat setting as contrasted with 75.1 percent of Duncan's photographs. Furthermore, 17.5 percent of Burrows' photographs fell into a combat preparedness setting in comparison to 24.1 percent of Duncan's. In their photographic images of different aspects of the Vietnam war, 38.6 percent of Burrows' images were judged to portray a noncombat setting, as compared to only .8 percent of Duncan's.

From these findings it appears reasonable to infer that Duncan chose to present the strictly military features of the war in contrast to Burrows' greater emphasis upon the aftermath and the side-effects of combat (i. e., wounded and displaced civilians: especially aged, women, and children). Chi square analysis of these subgroups of the combat preparedness and non-

TABLE 1
COMPARISON OF IMAGE CATEGORIES OF BURROWS' AND OF DUNCAN'S PHOTOGRAPHS
OF THE VIETNAM WAR, IN PERCENTAGES

Image category	Duncan		Burrows	
	No. of images (<i>N</i> = 249)	%	No. of images (<i>N</i> = 57)	%
Setting categorized as distinctly combat or likely combat	187	75.1	25	43.9
Setting categorized as combat preparedness	60	24.1	10	17.5
Setting categorized as noncombat	2	.8	22	38.6
American dead or wounded	34	13.7	7	12.3
Other casualties	4	1.6	27	47.4
Allied dead or wounded	0		3	
Enemy dead or wounded	4		3	
Enemy prisoners of war	0		4	
Civilian dead or wounded	0		17	
Civilians	0	.0	33	57.9
Women	0		14	
Children	0		17	
Aged	0		2	
Destruction of military targets	43	17.3	9	15.8
Close-up perspective	45	18.1	17	29.9
Normal perspective	164	65.8	33	57.9
Wide-angle perspective	40	16.1	7	12.2

combat categorization supports this conclusion at the $p < .001$ level of confidence (see Table 2).

Although Burrows' and Duncan's photographs of American military personnel (dead or wounded) are similar in magnitude (12.3 and 13.7 percent, respectively), their different emphases on what was happening to the "enemy," our Allies, and bystanding civilians were distinctly pronounced. Over 47.4 percent of Burrows' photographs portrayed the misfortunes of non-American soldiers and civilians (dead, wounded, or captured), while

TABLE 2
DEGREES OF COMBAT EMPHASIS IN DUNCAN'S AND IN BURROWS'
PHOTOGRAPHS OF THE VIETNAM WAR

Photojournalist	Degree of combat emphasis		<i>N</i>
	Distinctly combat or likely combat	Combat preparedness or noncombat	
Duncan	187	62	249
Burrows	25	32	57

Note: $\chi^2 = 19.5$; $df = 1$; $p < .001$.

only 1.6 percent of Duncan's photographs were so classified. The foregoing findings clearly reflect Burrows' concern about the total human condition (e. g., the effects of the war on the natives of that part of the world: non-American and nonmilitary casualties and captured prisoners) as contrasted with Duncan's more direct focus on the plight of the American soldier. Chi square analysis (utilizing Yates' correction) supports this conclusion at the $p < .001$ level of confidence (see Table 3).

Cursory comparisons of Burrows' and Duncan's portrayals of women, children, and the aged reveal extreme differences in their socially polarized orientations—57.9 percent in Burrows' photographic imagery as contrasted to Duncan's *complete* neglect of such imagery (0 percent).

Comparisons of photographic techniques (employment of normal perspectives in contrast to relatively specialized imagery obtained by using close-up and wide-angle fields of view) show that Burrows favored a more intimate portrayal of the personal-social effects of warfare (29.9 percent in the close-up category for Burrows as compared to 18.1 percent for Duncan). On the other hand, there is some evidence that Duncan preferred to present a broader perspective in his images (81.9 percent normal or wide-angle perspectives), while Burrows did not evidence such a strong preference (70.1 percent normal or wide-angle perspectives). Chi square analysis does not, however, provide statistically significant support to the foregoing, $.20 > p > .10$ (see Table 4).

D. INTERPRETATION OF FINDINGS

Perhaps the basic question that might be posed in reference to a discussion of Burrows' and Duncan's very different photojournalistic portrayals of the Vietnam war is this: What conditions might be antecedent to the observed differences in emphasis and style of these two "communicators?" It may be

TABLE 3
DEGREES OF EMPHASIS ON MILITARY AND NONMILITARY CASUALTIES IN
DUNCAN'S AND IN BURROWS' PHOTOGRAPHS OF THE VIETNAM WAR

Photojournalist	Degree of emphasis on military and nonmilitary casualties		N
	American (military) dead or wounded	Allied or civilian dead or wounded and enemy captured	
Duncan	34	4	38
Burrows	7	27	34

Note: $\chi^2 = 29.9$ (with Yates' correction); $df = 1$; $p < .001$.

TABLE 4
RANGE OF CLOSE-UP PERSPECTIVES, NORMAL PERSPECTIVES, THROUGH
INCLUSIVE WIDE-ANGLE PERSPECTIVES IN DUNCAN'S AND IN BURROWS'
PHOTOGRAPHS OF THE VIETNAM WAR

Photojournalist	Range of photographic perspective			N
	Close-up	Normal	Wide-angle	
Duncan	45	164	40	249
Burrows	17	33	7	57

Note: $\chi^2 = 3.72$ (with Yates' correction); $df = 2$; $.20 > p > .10$.

helpful to consider first personal sketches of Burrows and Duncan by independent observers (see Appendix B). After his death, two *Time-Life* editors, Graves (7) and Moser (9), wrote that Larry Burrows' major life concern was to be a photographer. Burrows viewed himself primarily as a conveyor of images, and did not wish to be known as a *war* correspondent or as a *war* photographer *per se*. Rather, he wished to be considered an imaginative photographer, sensitive to, and concerned with, all manner of human events.

In contrast, several quotations from the publication *I Protest* (3) and the photo-essay *War Without Heroes* (4) do much to illustrate Duncan's very pronounced involvement with the events of the Vietnam war (neither laudatory nor condemnatory). As he stated: "I'm just a veteran combat photographer. . . ." Duncan identified strongly with the specific duties to which he was assigned.

Further information about the observed differences in photographic emphasis and style between Burrows and Duncan may be derived from simply looking at their physical appearance as "combat photojournalists." Burrows' physical appearance while performing his duties as a *Time-Life* photographer in Vietnam was unusually revealing. In the four photographs of Burrows appearing in the publication on which the content analysis was based (6), he is *never* seen wearing any elaborate field gear or even a helmet. Burrows did not "look like a soldier." He was distinguishable in many ways from the soldiers even in the absence of the photographic equipment which was usually strapped around his neck and shoulders. Duncan's physical appearance however, in carrying out his assigned duties as a photojournalist, was distinctly different. In the two photographs of Duncan in his publications (3, 4) he is dressed in full combat field gear (with the exception of weaponry) and is wearing a steel helmet with camouflage accouterments. Duncan "*looks like a soldier*," and only the presence of camera equipment plus the absence of weapons would set him apart from the regular combat soldier.

Consistent with the foregoing differences in their physical appearance, the photographs produced by Burrows and Duncan reflect their different concerns and perceptions of the soldier and of the Vietnam war. The following comments based on the content analysis represent the present writers' assessments of these two photographers and their photographic imagery.

Burrows' "image slogan" in terms of his photographic coverage of war might well be "the plight of all individuals in a war zone." Burrows was not protesting the Vietnam war, nor was he criticizing the soldiers. He appeared to empathize strongly with the average soldier, but seemed compelled to portray the experiences of both combat and noncombat individuals in all the many dimensions of a war. The soldier, like all other human beings, can not only be beaten, wounded, and killed; he can also be shattered and broken—mentally and physically; he can be embarrassed and ashamed, and he can cry—like all men.

It appears that Burrows wished to portray the many facets of a war's effects on the entire people living within the confines of a country ravaged by war. Perhaps, he wished to illustrate the "fallout" suffering of everybody trapped in the dehumanizing vortex of war.

Duncan's photographic portrayal of the Vietnam war can best be described as "the Spartan image of the fearless, never-defeated American fighting man." It seems that Duncan wished to project an image of the guilt, physical plight, boredom, sorrow, anxiety, and the simultaneous strong sense of duty that is the heavy burden of a dedicated soldier. According to the images of Duncan, the soldier has a job to do—sometimes a horrible job, but one that must be faced, whatever the circumstances. There is a strong stoic quality in the majority of Duncan's photographic images. Although the soldier is admittedly always capable of fear, embarrassment, humiliation, shame, and tears, Duncan's photographic images avoid portraying such scenes. He preferred to be a patriotic photojournalist primarily concerned with the American soldier. Even though his photographs sometimes hint at human frailties among the American fighting men (e. g., soldiers with heads buried in their knees, complacent expressions, etc.), Duncan seemed to feel that the "dignity" and strength of the American soldier must always be emphasized.

Duncan seemed unable to produce any images of possible weaknesses in the American soldier as a "fighting machine," an aggressive fighting man, a sometimes weary but never demoralized soldier. His view seemed to be that women, children, aged, and all helpless civilians are necessarily affected adversely by wars, but that they are not an important part of the fighting, the destruction of the enemy, the winning, and the glory of securing "justice."

Another question related to an appraisal of Burrows' and Duncan's photo-

graphic images of the Vietnam war is this: What are the effects of such a differential portrayal of imagery on "middlemen" in the communication chain (newsmen, editorialists, etc.) and on the general audience? Four related news items extracted from *The New York Times* are relevant to the foregoing question. The first item is a photojournalistic editorial produced by Gene Thornton (11), related to a critical comparison of Burrows' and Duncan's Vietnam imagery; the second is a rebuttal to Thornton's editorial written and submitted to *The New York Times* by Duncan (5); the third is a reply to Duncan by Thornton (11); the fourth, and last, is a selection of letters to the editor of *The New York Times* from its public regarding the foregoing interchange between editor Thornton and photojournalist Duncan (11).

The qualitative material presented in these editorials is both supportive and corroborative of the quantitative findings presented in the present content analysis. Thornton's editorial constitutes a reasonably accurate description of both Burrows' and Duncan's Vietnam photographs. However, Thornton subtly criticized Duncan's emphases on the basis that Duncan's views were more closely geared to winning a war rather than bringing it to an end. By the same token, Thornton obviously favored the younger photographer's approach (i. e., according to Thornton, startling images which dwell on the horror and sorrow of war) as having the best possibility of convincing the majority of citizens of the desirability of bringing this particular war to an end. Thornton inferred that Burrows' photographs would be more effective in achieving this end.

Duncan's reply to Thornton appears defensive, and it seems reasonable to infer that Duncan felt deeply misunderstood and hurt by Thornton's comments. Duncan's dedication to protecting the dignity of the American soldier is illustrated in the following excerpt from his published rebuttal:

Never having attempted to establish my credentials as a war photographer by using that most loathsome of all Vietnam statistics, body count, I can only answer that there still are too many wounded and dead friends in my pictures at the Whitney. And I admit that as a final gesture of comradeship I almost never photographed their wracked bodies or lifeless faces. Call it the only battlefield grace within my power to bestow (5, p. 21).

Thornton's reply to Duncan was an attempt to get at the heart of what he considered Duncan's defensiveness; that is, although Thornton may have favored the Burrows' style of image portrayal, this preference did not challenge or overtly question Duncan's dedication to the dignity and valor of the American fighting man.

Whether anyone should have been accused of any transgression seems

irrelevant. Whether Burrows' photojournalistic and stylistic approach to the Vietnam war was any more effective or whether Duncan's portrayal was any less effective in communicating the presence or absence of the morality issues of the war seems to be primarily a function of personal characteristics of the audience. For some, Duncan's photographs may portray a more somber image of the Vietnam war than Burrows' pictures, while others may feel that Burrows' photographs portray an excess of images depicting human carnage and suffering. Nevertheless, the reality of Duncan's monolithic dedication to the American soldier and Burrows' pronounced concerns for the non-military and human components of war are demonstrated in the quantitative portions of the present content study.

The present investigators believe that the sociological significance and the power of photographic imagery have yet to be fully realized and understood, even though the development of photographic communication has been as significant as the invention of moveable type. The present research suggests important differential impacts of images related to the Vietnam war that were produced by two internationally known photojournalists. Visual forms of communication, as represented by photographic images, can be assumed to have potentially powerful influences on the opinions, attitudes, and beliefs of viewers.

Photographic imagery can be as important as verbal language in the symbolization of effective communication. Unlike the conventional linguistic types of communication, photographic imagery may project a number of different and subtle qualities which may make it an extremely powerful form of communication. We are living in what is often referred to as a photo-electronic age where interpretation of events based on imagery takes on special significance. In view of the realities of this very different communicative era, it may become theoretically meaningful and methodologically propaedeutic for social scientists to employ visual methods of research to study today's social problems. While there is little scientific precedent for visual approaches to the study of social issues, it is also true that many of the problems that man faces today are problems without methodological or theoretical precedents.

APPENDICES

APPENDIX A: DESCRIPTION OF IMAGE CATEGORIES

DISTINCTLY COMBAT OR LIKELY COMBAT SETTING

Infantry ground troops operations; weapons in use or at the ready; direct confrontation with the enemy.

Artillery or armour fire directly observable or overt display of armament; smoke or other indicators of shelling.

Aircraft missions—seek and destroy; medical evacuation within field positions; ground fire and other evidence of hostile action.

Medical operations in field hospitals depicting bunkers and other protective enclosures—hostile fire therefore expected.

Sheltered areas shown in conjunction with articles of war.

Combat support operations—supply, resupply, etc.

Dead and wounded depicted; military and nonmilitary casualties in field areas, and distinctly field hospitals.

Other direct evidence or symbolic representation of combat activity.

COMBAT PREPAREDNESS SETTING

High degree of face validity indicating combat; however, no obvious physiological evidence.

Indirect symbolic representation—helmets worn, weapons present, but not in use or at the ready; bunkers, foxholes, and other field emplacements visible.

Combat uniforms worn by military personnel (as opposed to obviously dress-type attire).

NONCOMBAT SETTING

Military personnel outside the context of field positions; distinctly non-combat type (dress) uniforms; cities, towns, villages depicted that are not combat involved.

Civilians in village situations—none of the characteristics typifying distinctly combat or combat preparedness categories.

AMERICAN DEAD OR WOUNDED

Self-explanatory; if doubt existed, not classified.

ALLIED DEAD OR WOUNDED

South Vietnamese troops; if doubt existed, not classified.

ENEMY DEAD OR WOUNDED

North Vietnamese troops or guerrillas; if doubt existed, not classified.

ENEMY PRISONERS OF WAR

Obvious captives of American forces; if doubt existed, not classified.

CIVILIAN DEAD OR WOUNDED

Persons without military affiliation.

WOMEN, CHILDREN, AGED

Self-explanatory.

DESTRUCTION OF MILITARY TARGETS

Obvious destruction of targets or property and materials relating to military missions; for classification purposes, must include MATERIAL (rather than destruction of human life alone) destruction.

CLOSE-UP PERSPECTIVE

Distinct and severe separation of foreground, middleground, and background in the photograph; concentration on a single subject, or extremely close proximity of multiple subjects.

NORMAL PERSPECTIVE

No specific focal point in photograph; lack of specialized approach; moderate distances between multiple subjects or relatively heterogeneous subject matter.

WIDE-ANGLE PERSPECTIVE

Impression of a perspective wider than the human eye could perceive in a single "glance"—a PANORAMA EFFECT.

APPENDIX B: PERSONAL SKETCHES

COMMENTS BY GRAVES PERTAINING TO BURROWS

At the time of his death, I wrote in *LIFE*: "I do not think it is demeaning to any other photographer in the world for me to say that Larry Burrows was the single bravest and most dedicated war photographer I know of." Later, when I talked to his wife, she said that was a nice thing for me to say but that she quarreled strenuously with one word: Larry wasn't a war photographer. He was a photographer. . . . As he said once, what he wanted to record was "the suffering, the sadness that war brings." He found it everywhere, in the soldiers of both sides, in the civilians who had to live through it, and very particularly in the Vietnamese children. . . . That is very much like Larry Burrows. Despite the risks he took to get his pictures, he was no hell-for-leather, gung-ho photographer. He was a deeply compassionate and thoughtful man, always conscious that he was working on the rim of tragedy. During the early years of the U. S. involvement in Vietnam, he was quite hopeful of the outcome, but as the war went on and on, and the suffering with it, he despaired about what was happening to the Vietnamese people and their country. His changing view was not unlike that of many Americans, but he was very much closer to it than any of us were (7, unpagd).

COMMENTS BY MOSER PERTAINING TO BURROWS

Larry had an extraordinary sense of delicacy. A war photographer is by definition a recorder of the suffering of others, and Larry used to worry about that. He said, "It's not easy to take a shot of a man crying, as though you have no feelings as to his sufferings." He took such pictures again and again because to him they were the ones that showed the truth of the war. . . . There are certain signatures, certain images that remain. The thick glasses, the towel around the neck to wipe off sweat, the loose-jointed lope in the field, the battery of cameras. . . . Because he had come through so much unscathed, people began to think he was invulnerable. After his death a friend said, "I can't believe it. I always tried to stay close to him in the field because I figured that nothing would ever happen to him and if I stayed close to him I'd be safe too." But Larry knew perfectly well that he was not invulnerable. . . . He always knew, precisely, how much danger he was in. He said once, "I will do what is required to show what is happening. I have a sense of the ultimate—death. And sometimes I must say, 'To hell with that.'" And that, again and again, is what he did (9, unpagged).

COMMENTS BY DUNCAN

I'm just a veteran combat photographer and foreign correspondent who cares intensely about my country and the role we are playing—and assigning to ourselves—in the world of today. And I want to shout a loud and clear protest at what has happened at Khe Sanh, and in all of Vietnam (3, p. 1).

Author's Memo to Vietnam Veterans: These photographs have been printed in sheet-fed gravure, the finest process known for reproducing my type of work. Enschedé, my printers here in Holland, are among the most respected in the world and have been perfecting their craftsmanship for over two hundred and sixty years. Special paper and ink were made and chosen for this book. The binders, Van Rijmenam, ordered a tough cloth woven for the cover, in a color which I feel belongs on a book dealing with the lives and deaths of soldiers. Both Enschedé and Van Rijmenam have made every effort to give me the finest physical qualities obtainable in an illustrated book, while keeping costs within my ability to pay.

My publishers, Harper & Row, in whose hand the final sales price rests, are presenting this volume without profit to themselves—as a public service to you—although no one at Harper & Row has said as much to me. Everyone—printer, binder, publisher—joined me in producing this work at a price that keeps it out of the "coffee table" art book category. My purpose, of course, being that I wanted to be able to offer you men a lasting tribute to your own personal sacrifices in Vietnam, of which I recorded and shared a fractional part.

But my deeper reason for making this book as beautifully as possible is so that it may endure as a testament of the strength, humor, gentleness, dignity, with which you conducted your lives during one of the dirtiest and roughest periods in recent world history; a period when other men, far from

the battlefield, could have enhanced themselves by following your examples (4, p. 25).

Once again, I depend upon two Leicas (custom-built M3D's), crossed bandolier-style on my chest. . . . Except for cameras, helmet and flak jacket, my only equipment is a webbed pistol belt on which I hang two canteens (one on each hip), a sheath knife and four ammo-clip pouches (two on either side of the belt buckle, each holding five 35mm film cans apiece). Cleated dead center into the back of the webbed belt—touching my tail bone—there is a medical corpsman's three-pouched, waterproof, unfolding supply kit. In one pouch I store approximately fifty rolls of 35mm Tri-X specially sealed in discarded Ektachrome cans by darkroom friends at *LIFE*. If I sink into a rice paddy or flood out in the monsoon rains, my film remains safe and dry. In the other two pouches I carry an extra pair of socks, an extra pair of skivvy shorts, a towel, razor, bar of soap, toothbrush and toothpaste, an extra pocket-size notebook, a pair of binoculars, and a sub-miniature radio—all in plastic, waterproofed bags (4, p. 252).

REFERENCES

1. BAKER, S. *Visual Persuasion*. New York: McGraw-Hill, 1961.
2. BERELSON, B. *Content Analysis in Communication Research*. Glencoe, Ill.: Free Press, 1952.
3. DUNCAN, D. D. *I Protest*. New York: Signet (New Amer. Lib.), 1968.
4. ———. *War Without Heroes*. New York: Harper & Row, 1970.
5. ———. David Duncan protests. *N. Y. Times*, July 23, 1972.
6. EDITORS OF *LIFE MAGAZINE*. Larry Burrows, *Compassionate Photographer*. New York: Time-Life Books, 1972.
7. GRAVES, R. Managing editor's introduction. In *Larry Burrows, Compassionate Photographer*. New York: Time-Life Books, 1972.
8. MC LUHAN, M., & FIORE, Q. *The Medium is the Massage: An Inventory of Effects*. New York: Bantam Books, 1967.
9. MOSER, D. Assistant managing editor's introduction. In *Larry Burrows, Compassionate Photographer*. New York: Time-Life Books, 1972.
10. POOL, I. DE S. *Trends in Content Analysis*. Urbana: Univ. Illinois, 1959.
11. THORNTON, G. Do war pictures change anything? *N. Y. Times*, June 25, 1972.

Department of Sociology
The Ohio State University
Columbus, Ohio 43210

INTERGENERATIONAL COMPARISON OF ATTITUDES TOWARD BASIC LIFE CONCEPTS*¹

*Department of Home Economics, The University of Akron; and
Commonwealth Careers Program, Harrisburg (Pennsylvania) State Hospital*

BARBARA N. ARMSTRONG AND MARTHA M. SCOTZIN

SUMMARY

The existence of no significant attitudinal differences between three generations of selected families was hypothesized. Basic life attitudes of 199 college students were compared with those of their middlescent parents and senescent grandparents. The Adolescent-Middlescent Attitude Scale developed by Armstrong was administered to the adolescents in the college classroom and mailed to parents and grandparents. The least squares analysis of variance was employed to determine the amount and direction of variance in attitudes among the three generations of respondents. The *F* factors were found to be significant at the .05 level of confidence. This finding suggested the possibility of basic attitudinal differences among the adolescent, middlescent, and senescent groups. Significant variance was found within the middlescent generation, revealing attitude differences between the adolescent's mother and father in relation to basic life concepts. Adjustment similarities and differences among the three generations were predicted from the attitudinal data.

A. INTRODUCTION

1. *A Study of Intergenerational Attitudes and Adjustment*

Are attitudes pertaining to basic life concepts similar among adolescent, middlescent, and senescent members of the same family? Do family members adjust equally well during each of these three stages of life? Such data are essential to the determination of the intergenerational status of the contemporary American family. Thus, the purpose of the study was to measure

* Received in the Editorial Office on May 9, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Research reported in this study was conducted by the authors at The Ohio State University. It is reported in its entirety by Martha A. Scotzin in "Attitude similarities and differences among three generations of the same family lines," unpublished Master's thesis, The Ohio State University, Columbus, 1972.

attitudes and adjustment similarities and differences among three generations of family members.

2. *Related Research in Intergenerational Studies*

A major developmental task of adolescence is the establishment of a set of attitudes with which the individual can live and interact with others successfully. Speculation about and study of the "storm and stress" period in life (14) has led some researchers to view rebelliousness as an integral part of the late adolescent period (13).

Elkind (8, pp. 490-497) explained generational conflict as a developmental phenomenon in the process of self-differentiation. He stated that an "implicit contract" of expected behaviors was made between adult and child which was fulfilled or violated at successive developmental levels. Wakefield (26) indicated that, although parents were able to predict their adolescent's responses to an attitude checklist accurately, this "parental awareness" was unrelated to the degree the adolescent liked his parents or saw himself as similar to them.

Troll (24) studied resemblances in values and personality dimensions between 100 college students and their parents. Values were found to be more similar than personality traits, with greater resemblances shown between the married couple than between parents and children.

The maintenance of already established attitudes and values is one major task of the middlescent years. Horrocks and Mussman (15) studied age-related stress periods during adult years. An analysis of their findings revealed that the early forties may be a period of generalized dissatisfaction with life in general. Attitude intensity and level of psychic stress felt were seen to vary with age, occupation, and sex of respondent. Peck and Berkowitz (20) noted a crisis period occurring in the fifties. However, satisfactory adjustment to the postparental stage of life was reported by both Axelson (3) and Deutscher (6).

Increased longevity during the past half century has resulted in the need for research pertaining to the senescent period of the life cycle. The final developmental stage which Erikson (9) referred to as integrity *versus* despair involves either a continuation of previous attitudes or a desire to relive all or parts of one's life. Several investigators (12, 19, 20) have found little change in attitudes or personality flexibility with increasing age. The concept of disengagement has been cited as one of the senescent person's method of adjustment to his environment and reclining social perception (21, 23).

3. *Intergenerational Status of the Contemporary American Family*

Similarities of attitudes across the lifespan would tend to suggest that the family continues to be influential in the attitudinal development of its members. Attitudinal differences among generations could reflect cultural changes affecting individuals and a relative decrease in the influence of the family upon its members.

Few research studies have been directed specifically toward the measurement of attitudes and adjustment across three generations of the same family lines. Differences in family life patterns between older and younger generations may be due to either changes within the families or to differing societal conditions affecting families. This problem emphasizes the need for longitudinal studies of attitudes among family members.

Greenfield and Finkelstein (11) compared personal-social characteristics of junior high school students with a similar sample examined 30 years ago and reported differences resulting from technological and/or cultural changes. Kerckhoff (18) identified three basic "value clusters" that may characterize families, providing a basis for family interaction and attitude development. Feldman (10) found high degrees of interaction among young couples and both sets of parents. Aldous (1) stated that the amount of transmission of cultural attitudes and values affects the contact between generations.

Several studies have been reported concerning the attitudes of individuals toward other generations (4, 5, 7, 22, 25). A recent study by Kalish and Johnson (17) was concerned with attitudes of three generations of women from the same family lines. Attitude differences among generations were viewed as a function of the particular issue in question. For some issues, gaps between grandmothers and mothers were wider than gaps between grandmothers and granddaughters.

4. *Statement of the Problem*

The primary question central to the design of the study was whether or not attitudes pertaining to life concepts are similar among three generations of the same families. In this study, the attitude similarities and differences among adolescent, middlescent, and senescent members of the selected families were investigated.

Basic to the prediction of human behavior and interrelationships are data pertaining to individual and familial attitudes and values. Values tend to affect everything one does, since they are judgments about the worth of

entities or concepts in relation to one another. Values form a basis for the development of attitudes, which are relatively stable mental sets to respond to a situation, implying a more active role than that of values. The knowledge acquired from a study of the attitudes of humans in three generations of families toward basic life concepts could provide information regarding the ways people are predisposed to behave and relative to familial congruity and influence in the attitudinal and adjustive realms.

B. METHOD

The Adolescent-Middlescent Attitude Scale (AMAS), which was developed by Armstrong (2) was employed to measure the intensity and direction of attitude scores of respondents. The concepts included on the scale referred to attitudes basic to life in general rather than those which tend to be transient in nature. Each of the 12 concepts appeared three times on the instrument, yielding a total of 36 items for attitudinal response. The concepts included on the AMAS were *Children, Health, Marriage, Leisure, Future, Community, Friends, School, Parents, Church, Daily Tasks, and Self*. Each concept was aligned with a pair of bipolar adjectives. Responses were rated on a five-point continuum. The highest possible or the most positive score for each concept was 12 or a total attitude scale potential of 144. Thus, the respondents to the AMAS revealed whether or not their attitudes tended to be positive or negative, as well as the relative intensity of attitudinal responses toward familial and life concepts.

The test-retest reliability coefficient for the AMAS with one week interval between its administration to 71 ninth grade adolescents was .87. Validation was established by comparing actual scores made by respondents to the instrument (AMAS) and the mean attitude scores derived by two independent ratings of tapes made when the participants responded to open-ended questions pertaining to the concepts included on the AMAS. The Spearman technique of rank correlation was applied to a comparison of actual and rater attitude scores, yielding a coefficient of .91 ($p = .01$).

Demographic data collected about the respondents to the AMAS included employment status, generational group, educational level, age, sex, number of children in family, and birth order in family.

Subjects for the study included an accessible population of 199 college students (mean age = 20.21), 287 of their parents (mean age = 48.88), and 163 maternal and paternal grandparents (mean age = 72.79). (See Table 1.) The AMAS was administered to the college students during a regularly scheduled class period. Attitude surveys were mailed to parents

TABLE 1
RESPONDENTS TO THE ADOLESCENT-MIDDLSCENT ATTITUDE SCALE

Generation	Female	Male	Total
Adolescent	177	22	199
Middlescent	147	140	287
Senescent			
(Maternal)	66	30	96
(Paternal)	47	20	67
Total respondents	437	212	649

and grandparents who, in the student's opinion, were coherent, willing, and able to participate in such a study. Sixty-three percent of the mailed attitudinal surveys were returned and utilized in the data analysis.

The female adolescent respondents far outnumbered the male adolescent respondents because of the composition of the family development course in which the participating students were enrolled. It is noteworthy to point out that nearly as many fathers responded to the survey as mothers, indicating that fathers and mothers equally were willing to participate in such a study.

C. FINDINGS AND DISCUSSION

The least squares analysis of variance was employed to determine the amount and direction of variance in attitudes among the three generations of respondents. The *F* factors were found to be significant at the .05 level of confidence when the attitudes of the three generations were compared (Table 2). This suggests the possibility of basic attitudinal differences among the adolescent, middlescent, and senescent groups in the study. Significant variance ($p = .05$) was found within the middlescent generation revealing attitudinal differences between the adolescent's mother and father in relation to basic life concepts. The *F* factors for the demographic data when compared to total attitude scores were not significant.

1. Generational Differences

Significant differences occurred among the three generations sampled on the concepts *Children, Health, Future, Community, School, Church, Daily Tasks* ($p = .01$) and *Self* ($p = .05$). It seems evident that, for these concepts, familial influence was not the determining variable in attitude development (Table 3).

No significant differences were found to exist among the three generations of respondents to the AMAS on the concepts *Marriage, Leisure, Friends, and Parents*. Thus, adolescent, middlescent, and senescent members of the same

TABLE 2

LEAST SQUARES ANALYSIS OF VARIANCE AMONG THREE GENERATIONS OF RESPONDENTS TO THE ADOLESCENT-MIDDESCENT ATTITUDE SCALE FOR TOTAL ATTITUDE SCORES

Variable	Least squares Mean	Standard Error	F
Generation			6.32*
Adolescent	109.25	1.66	.42
Middlescent	112.06	.95	4.47*
Senescent	116.54	1.40	1.66
Daughters	110.27	1.20	
Sons	108.22	3.01	
Mothers	113.80	1.16	
Fathers	110.33	1.35	
Maternal grandmothers	119.54	1.92	
Maternal grandfathers	118.27	2.59	
Paternal grandmothers	116.45	2.29	
Paternal grandfathers	111.88	3.16	
Mean	112.62	.76	22139.97
Employment	112.43	.91	.54
Number of children		.40	.02
Position		.31	.06
Education		.45	.51

* Significant at the .05 level of confidence.

families were found to reflect basic attitudinal similarities in these four conceptual realms. The families included in the study, therefore, seemed to have been effective in perpetuating attitudes at least in relation to four key family life areas.

2. Generational Similarities

Similarities between responses of two generations were noted for several concepts. The adolescent and middlescent generations responded similarly to the concepts *Friends* and *Self*. Parents seemed to influence how their adolescent children perceived themselves and others. Therefore, family interaction may have been an important factor in the attitudinal development of the adolescents participating in the study. The middlescent and senescent generations responded similarly only to the concept *Marriage*, which may be a function of familial influence or social convention.

On the concept *Marriage*, however, the males and females of each generation registered similarity in attitudes, a finding also reported in Armstrong's (2) original study utilizing the AMAS. This may imply that attitudes toward marriage are relatively stable among respondents of each generation and are reinforced by family members and by social expectation. The adolescent respondents did not seem to react as intensely to the concept *Children* as did

TABLE 3
MEAN SQUARES AND *F* FACTORS FOR CONCEPT SCORES OF INTERGENERATIONAL RESPONDENTS
TO THE ADOLESCENT-MIDLESCENT ATTITUDE SCALE (AMAS)

Variables	Children	Health	Mar- riage	Leisure	Future	Com- munity	Friends	School	Parents	Church	Daily Tasks	Self
Generation												
Adolescent	8.61	10.22	10.31	8.31	10.84	7.16	9.73	9.44	9.79	6.90	8.09	9.38
Middlesex	9.76	9.50	9.70	8.00	9.99	8.56	9.73	10.44	9.41	9.23	8.92	9.31
Senescent	10.00	9.17	9.76	8.29	9.57	9.30	10.24	10.67	9.66	9.83	9.93	9.93
Daughters	8.86	9.86	10.31	8.06	10.97	7.47	9.81	9.99	9.80	7.78	7.98	9.15
Sons	8.35	10.58	10.31	8.57	10.72	6.86	9.64	8.89	9.77	6.01	8.21	9.61
Mothers	9.81	9.56	9.63	8.08	10.15	8.67	9.92	10.65	9.40	9.55	8.95	9.30
Fathers	9.70	9.45	9.76	7.91	9.83	8.45	9.54	10.23	9.42	8.91	8.89	9.32
Maternal												
grandmothers	10.22	9.51	9.86	8.77	10.07	9.41	9.99	10.93	9.94	10.70	9.97	9.95
Maternal												
grandfathers	10.20	9.46	10.46	8.55	9.78	9.29	10.78	10.74	9.94	9.68	9.79	9.99
Paternal												
grandmothers	10.00	9.26	9.58	8.29	9.44	9.47	10.31	10.51	9.51	10.06	9.83	9.97
Paternal												
grandfathers	9.60	8.45	9.16	7.55	9.00	9.02	9.87	10.50	9.23	8.87	10.13	9.81
<i>F</i> factors ^a	15.75**	9.78**	2.41	.70	11.29**	15.98**	3.10	9.97**	.82	27.17**	19.54**	4.09*

^a *F* factors from least squares analysis of variance for concept scores of three generations of respondents to the AMAS.

* Significant at the .05 level of confidence.

** Significant at the .01 level of confidence.

their parents and grandparents, possibly either because they have no children of their own or because they view the child role as relatively unimportant in the total family and societal complexes.

Similar responses were given by the adolescent and senescent generations to the concepts *Leisure* and *Parents*. Both adolescent and senescent respondents viewed the concept *Parents* more positively than did the middlescent generation, suggesting possible frustrations in the realm of perceived effectiveness in child rearing on the part of the middle-aged respondents. It was apparent that the adolescent and senescent respondents to the AMAS tended to have *Leisure* in common, with retirement, school vacations, and relatively limited permanent employment opportunities for both groups.

3. *Generational Attitude Intensity*

An analysis of mean scores for all concepts on the AMAS revealed that total attitude intensity tended to increase with advanced age. Total mean scores for females were higher than those for their male counterparts in all three generations. Intensity of attitudes decreased with age only in the conceptual realms of *Health* and *Future*.

Female respondents to the AMAS in all three generations scored higher than male respondents to the four concepts *Children*, *Community*, *Church*, and *Future*. This finding would support a societal expectation that women should be more concerned than men with their families, homes, and religion.

The decrease in intensity of attitudes with age for the concept *Health* may imply resignation or conflict in the grandparent group to old age and declining health. Attitudes registered toward the concept *Self*, however, revealed that the senescent respondent's attitudes were the most positive of the three generations, indicating that health may not have a major effect upon self-concept. In addition, the senescent generation registered positive attitudes toward *Leisure* and *Daily Tasks*, suggesting, in contrast to much of the current literature, that this period of life is interesting and fulfilling for the senescent participants.

The high degree of attitudinal intensity registered in relation of the concept *Health* among the adolescent respondents to the AMAS may have reflected an appreciation for their youth and the importance of health, particularly to the adolescent males. The positive scores of the adolescent participants for the concept *Future* are interpreted to suggest that the adolescent generation tended to be more concerned with the future than were their parents and grandparents.

The intensity of attitudes toward the concept *School* increased with age,

reflecting the perceived importance of education among adults and indicating somewhat of a generation gap between the adolescent and middlescent groups relative to this concept. The adolescent participants in the study may have viewed education as a means of obtaining material rewards when, in reality, they were seeking nonmaterial goals and reinforcements. Also the college bound adolescent generation may have become disillusioned and/or they may have begun to take education for granted.

The adolescents scored lowest of the three groups on the concepts *Children*, *Community*, *School*, *Church*, and *Daily Tasks*. An analysis of their responses indicated dissatisfaction with specific social institutions or groupings including the community, church, and school. It was difficult to refute the concepts of adolescent rebellion and resultant search for one's self-identity as a result of this study even though the scores for the concept *Self* were relatively positive. Adolescents scored highest of the three generational groups on the concepts *Health*, *Marriage*, *Leisure*, and *Future*, which may represent not only concepts they view positively in the present, but ones they will consider important in later life.

4. Middle-Aged Slump

Support was obtained from an analysis of the data for the possible occurrence of a "middle-aged slump" in the lives of family members participating in the study. The middlescent generation's scores were lowest of the three groups on the concepts *Marriage*, *Leisure*, *Parents*, and *Self*. This generation, being preoccupied with such concerns as careers, raising children, or adjusting to the empty-nest stage of family life, and possibly giving assistance to both the adolescent and senescent generations, seemed to be experiencing stress. Dissatisfaction with marriage, a lack of leisure time or inability to utilize leisure in a satisfying manner, and other complex problems may have impeded the subsequent rediscovery of their own identity in middlecence.

Kalish (16) viewed the middlescent generation as the group that controls society and, therefore, the ones that must shoulder the inherent responsibilities and the resultant stress. The middlescent generation failed to register the most positive attitude scores among the three generations on any of the AMAS concepts, a finding that implies the existence of frustration and/or stress.

5. Satisfaction in Senescence

The senescent generation scored higher than the two other generational groups on seven out of 12 concepts on the AMAS (*Children*, *Community*,

Friends, School, Church, Daily Tasks, and Self). The only concepts on which the senescent generation had the lowest scores in comparison with the other generational groups were *Health* and *Future*. These findings tend to refute much of what has been written about senescent dissatisfaction with life in general. Senescent participants in this study seemed to find greater satisfaction within their lives than did younger members of their families.

6. *Correlation Between Generational Group Scores*

Correlation coefficients between total attitude scores for the 12 basic concepts included on the AMAS were found to be significant at the .01 level of confidence for the mothers and fathers of the adolescent participants in the study, as well as for the adolescent's maternal grandmothers and maternal grandfathers. Total attitude scores significant at the .05 level of confidence were found to exist for the maternal grandmother-mother dyad and for the maternal grandfather-mother dyad. The .05 level of significance for total attitude scores was approached by the mother-adolescent son, mother-adolescent daughter, and father-paternal grandmother dyads.

7. *Relationship of Adjustment to Attitude Intensity*

The adjustment of the intergenerational participants was inferred from the direction and intensity of attitude scores (Figure 1). Scores near the middle or neutral point on the attitude continuum were interpreted as representing the existence of psychological conflict or marginal adjustment. Far judgments (those varying from neutral or midpoint on the continuum) were interpreted as depicting better than marginal adjustment. The more intense or farther away from neutral was the score, the better was the inferred adjustment of the individual to his environment. Thus, similarity in attitude intensity among adolescent, middlescent, and senescent participants was suggestive of their adjustive congruence.

An analysis of Figure 1 reveals the existence of adjustment similarity among the three generations in relation to the concepts *Health, Marriage, Leisure, Friends, School, and Self*. Major adjustive differences among the three groups occurred in response to the concepts *Children, Future, Community, Church, and Daily Tasks*. The adolescent respondents registered the lowest attitude scores of the three participating groups and indicated, therefore, more potential adjustive problems than the other two participating groups. The senescent members of the sample registered the highest attitude scores of the three generational groups, thus revealing better potential adjustment than their familial counterparts in other generations.

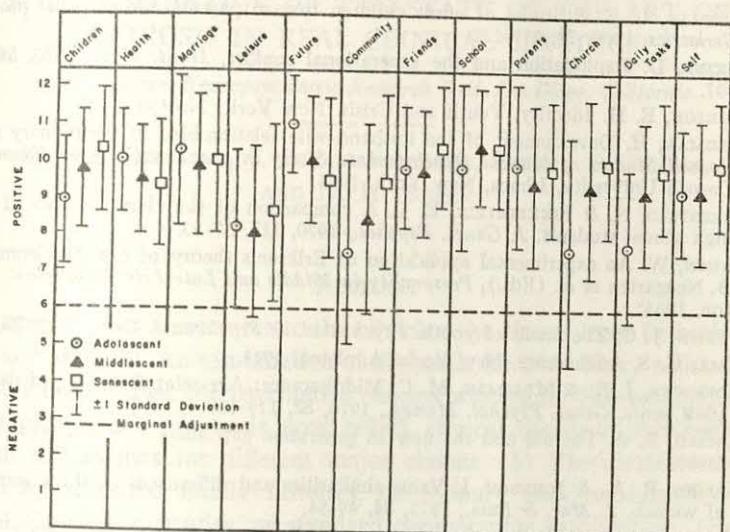


FIGURE 1
MEAN AND STANDARD DEVIATION SCORES FOR CONCEPTS ON THE
ADOLESCENT-MIDDLE-ADULT ATTITUDE SCALE

8. Implications

Clearly implied in the findings is the need for intensified study in relation to middle-Adult family members and to the formulation of educational efforts geared to meeting the needs of individuals at every stage of the life cycle. Particular emphasis is recommended for educational programming geared to increasing interpersonal and intrafamilial competencies of both middle-aged men and women.

REFERENCES

- ALDOUS, J. The consequences of intergenerational continuity. *J. Mar. & Fam.*, 1965, **27**, 462-468.
- ARMSTRONG, B. N., & TAYLOR, C. M. Attitudes and adjustment of adolescents and their middle-Adult mothers. *J. of Psychol.*, 1972, **81**, 105-115.
- AXELSON, L. J. Personal adjustment in the postparental period. *J. Mar. & Fam.*, 1960, **22**, 66-68.
- BORKE, H. Continuity and change in the transmission of adaptive patterns over two generations. *J. Mar. & Fam.*, 1963, **25**, 294-299.
- . A family over three generations: The transmission of interacting and relating patterns. *Mar. & Fam. Living*, 1967, **29**, 638-655.
- DEUTSCHER, I. The quality of postparental life: Definition of the situations. *J. Mar. & Fam.*, 1964, **26**, 52-59.

7. EGERMAN, L. E. Attitudes of adult children toward parents and parents' problems. *Geriatrics*, 1966, **21**, 217-222.
8. ELKIND, D. Exploitation and the generational conflict. *Ment. Hyg.*, 1970, **54**, 490-497.
9. ERIKSON, E. H. *Identity, Youth and Crisis*. New York: Norton, 1963.
10. FELDMAN, H. Development of the husband-wife relationship. In preliminary report, *Cornell Studies of Marital Development: Study in the Transition to Parenthood*, Cornell University, Ithaca, New York, 1964.
11. GREENFELD, N. & FINKELSTEIN, E. L. A comparison of the characteristics of junior high school students. *J. Genet. Psychol.*, 1970, **117**, 37-50.
12. GRUEN, W. An experimental application of Erikson's theory of ego development. In B. Neugarten et al. (Eds.), *Personality in Middle and Late Life*. New York: Atherton, 1964.
13. GUSTIN, J. C. The revolt of youth. *Psychoanal. & Psychoanal. Rev.*, 1961, **98**, 78-90.
14. HALL, G. S. *Adolescence*. New York: Appleton, 1911.
15. HORROCKS, J. E., & MUSSMAN, M. C. Middlescence: Age-related stress periods during adult years. *Genet. Psychol. Monog.*, 1970, **82**, 119-159.
16. KALISH, R. A. The old and the new as generation gap allies. *Gerontologist*, 1969, **9**, 83-89.
17. KALISH, R. A., & JOHNSON, I. Value similarities and differences in three generations of women. *J. Mar. & Fam.*, 1972, **34**, 49-54.
18. KERCKHOFF, A. C. Norm-value clusters and the "strain toward consistency" among older married couples. In I. H. Simpson & J. C. McKinney (Eds.), *Social Aspects of Aging*. Durham, N. C.: Duke Univ. Press, 1966.
19. NEUGARTEN, B., CROTTY, W. F., & TOBIN, S. S., Eds. *Personality in Middle and Late Life*. New York: Atherton, 1964.
20. PECK, R. F., & BERKOWITZ, H. Personality and adjustment in middle age. In B. Neugarten et al. (Eds.), *Personality in Middle and Late Life*. New York: Atherton, 1964.
21. SPITZER, E. P. Disengagement: Self-preservation or self-defense? *Voices: Art & Sci. Psychother.*, 1969-70, **5**(4), 28-32.
22. STREIB, G. F. Intergenerational relations: Perspectives of the two generations on the older parent. *J. Mar. & Fam.*, 1965, **27**, 469-476.
23. TREANTON, J. The concept of adjustment in old age. In R. Williams (Ed.), *Processes of Aging* (Vol. 1). New York: Atherton, 1963.
24. TROLL, L. E. Similarities in values and other personality characteristics in college students and their parents. *Merrill-Palmer Quart.*, 1969, **15**, 323-336.
25. VANBUSKIRK, M. F. Attitudes of adolescents and their mothers toward elderly persons. Unpublished Master's thesis, The Ohio State University, Columbus, 1970.
26. WAKEFIELD, W. M. Awareness, affection, and perceived similarity in the parent-child relationship. *J. Genet. Psychol.*, 1970, **117**, 91-97.

Department of Home Economics
The University of Akron
Akron, Ohio 44325

A CONSIDERATION OF THE STATE OF THE ART OF DIAGNOSIS IN REAL CLINICAL SETTINGS*¹

Navy Medical Neuropsychiatric Research Unit, San Diego, California

DARREL EDWARDS, J. SUSAN FICHMAN, STEVEN F. BUCKY,
AND N. H. BERRY

SUMMARY

If diagnosis is to be of value to the clinician the classes must be both functional and different. An examination of diagnosis for 2824 Navy enlisted men who were hospitalized for psychiatric reasons was made. The results showed the following: (a) Diagnosis does reflect clinical decisions manifested by different dispositions for different major classes. (b) The classes were not defined by standard family histories, disciplinary and job histories, past medical histories, attitudes, or standard demographic information. (c) The categories do define distinct factors as used by psychiatry in one industrial setting—the Navy. (d) these results would lead to a Feighner *et al.* (4) conclusion that the nomenclature is meaningful and can function usefully in a setting in which real defined outcomes are being decided. (e) Studies arguing against the use of diagnostic nomenclature may have some points to make, but their results are limited. Perhaps many experimentally structured tests of the nomenclature have not attended to the dimensions of diagnosis functioning in clinical settings.

A. THE PROBLEM

Every *n* years, amid argument and emotion, a revision of diagnostic nomenclature is proposed. In May 1966, the *International Classification of Diseases, Eighth Revision*, was adopted by the Nineteenth World Health Assembly for use in member states beginning in 1968 as the latest edition. A slightly revised version, the *Eighth Revision International Classification of Diseases Adapted for Use in the United States* (ICDA-8), was published by the Public Health

* Received in the Editorial Office on May 13, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.
¹ Report Number 73-18, supported by the Bureau of Medicine and Surgery, Department of the Navy, under Research Work Unit MF51.524.002-5014DX5F. Opinions expressed are those of the authors and are not to be construed as necessarily reflecting the views of the Department of the Navy.

Service. Section V of the system on psychopathology has always raised strong questions concerning, even, the efficacy of a diagnostic system. The committee on Nomenclature and Statistics of the American Psychiatric Association prepared the *Diagnostic and Statistical Manual of Mental Disorders*, Second Edition (DSM II) as an explanatory guide and slight revision to the new classification system. This new scheme is used in many hospital, social, and industrial settings.

Transition from the old classification model (DSM I) to DSM II has posed some conceptual problems in which label differences affect diagnosing behavior by the clinician (3). Some clinicians affirm that the differences are more than linguistic and challenge the basic assumptions of the nomenclature system, crying to abandon it (1, 5, 6). An alternative by Feighner *et al.* (4) strongly proposes that the diagnostic classes are functional as long as categories validated by followup and family studies are used.

The present study proposes to examine a number of demographic and behavioral variables in order to arrive at a decision among the alternatives concerning the efficacy of psychiatric diagnosis. Although it is obvious that any limited sample of patient data does not constitute a complete diagnostic pattern, it was assumed that if nomenclature categories are to be meaningful, the classes could be differentiated on a number of dimensions consistent with DSM II descriptions of those classes.

B. ANALYSES

1. *Diagnosis, Disposition, and Outcome*

a. Procedure. Diagnosis was used as a major predictor in a study of clinical dispositions and industrial effectiveness in a military setting (2). Fifty-two variables of demographic, behavioral, and clinical information were collected on 2824 Navy enlisted men who were admitted to 23 Navy psychiatric hospitals throughout the world. Effectiveness was defined as completion of the current enlistment in progress at the time of hospitalization and recommendation for re-enlistment.

b. Results. The three most powerful variables predicting effectiveness in the hospital population were (a) years of service ($r = .41$), (b) diagnosis ($r = .41$), and (c) number of days in the hospital ($r = .26$). Each of these variables contributed significantly to a multiple correlation regression equation ($R = .56$), cross-validation ($r = .55$). The major diagnostic classes (psychosis, neurosis, personality disorder, and situational maladjustment) could significantly differentiate between effectiveness and noneffectiveness for a hospitalized sample. The different rates of effectiveness for the classes are

as follows: (a) situational maladjustment—46%; (b) neurosis—28%; (c) personality disorder—12%; and (d) psychosis—4%. It can be concluded that there are some functional clinical differences between the categories. These rates reflect the number of men not returned to duty, as well as the effectiveness rate of those men returned to duty—in short, sound clinical decisions.

The argument can be made that diagnosis follows disposition. That is, if the proposition that the diagnostic classes are functionally different and therefore useful is to be demonstrated, it must be shown that the labels are not given merely to achieve an end in industrial settings. Will the diagnosis be given after the disposition has been determined? For example, if a man is to be maintained in an occupational setting, will the diagnosis reflect situational, transient disturbance regardless of his clinical picture? If the answer is "yes" to these questions, diagnostic names become administrative rather than clinical tools.

To answer the question, an analysis was made of those men who were returned to duty in the Navy after hospitalization. Nine percent of those diagnosed as psychotic were returned to duty; 32% neurotic; 24% personality disorder; and 79% situational maladjustment. Diagnosis was the eighth most powerful variable ($r = .21$) of 11 significant variables in the regression equation to predict effective performance for those men who were returned to duty after hospitalization ($R = .45$; cross-validated $r = .40$). Of the patients returned to duty who were diagnosed as psychotic, 79% were effective; of neurotics, 77% effective; of situational maladjustment, 84% effective; and of personality disorders, 46% effective.

c. Comment. Diagnostic class did differentiate between the performance of patients in an occupational setting, as well as reflect clinical dispositional decisions. The clinical dispositions followed expectation from diagnostic information. Only highly selected psychotics were returned to duty, while many men diagnosed as situational maladjustment were returned to duty; but, even for those returned to duty, different diagnoses were given. The classes were treated as functional, clinical tools.

2. *Diagnosis, Demography, and Behavioral Profiles*

a. Procedure. Since the categories did reflect real outcome differences, an analysis was undertaken to differentiate demographic and behavioral profiles for the four major classes in order to understand diagnosis more fully. A regression analysis technique was used to develop a profile for each class. The results were validated by correlating predicted group assignment for

each patient to the actual diagnostic (demographic and behavioral) profile for each man.

b. Results

(1). *Personality disorders.* A multiple correlation coefficient (R) of .53, cross-validated at .37, was obtained for a 13-variable function. The profile was considered unstable, in view of the decrement in the cross-validity. Three variables were weak, but stable: (a) first enlistees (who were younger) were likely to be diagnosed personality disorder ($r = .20$); (b) career oriented men were not likely to be diagnosed personality disorder ($r = .19$); and (c) men with prior psychiatric contact for disciplinary reasons or work problems were likely to be diagnosed personality disorder ($r = .09$).

(2). *Neurosis.* An R of .59 cross-validated at .47 was obtained for a six-variable function. Although the profile was still somewhat unstable, there were four stable variables in the profile: (a) older men with more service years ($r = .20$); (b) clean disciplinary record ($r = .13$); (c) prior hospitalization for nonpsychiatric reasons ($r = .08$); and (d) a stable preservice work history ($r = .10$).

(3). *Psychosis.* An R of .76 and a cross-validation r of .30 were obtained. Only age (younger men were more likely to be diagnosed as psychotic) was stable ($r = .19$). The profile could not be accepted.

(4). *Situational maladjustment.* An R of .59 and a cross-validation of .04 were obtained. The function appeared completely unstable.

c. Comment. The attempt to distinguish one diagnostic class from another with use of demographic and selected behavioral variables met with little success. Although the stable variables did reflect some of the content of a description of the diagnostic categories, the weak to modest relationships reflect an even distribution of variable levels across classes. Apparently, diagnosis more strongly reflects clinical impression than history, attitudes, and demography.

3. Diagnostic Factors

a. Procedure. A factor analysis was done on the 52 variables used in this study, including diagnostic name, in order to determine the data structure for the diagnostic classes. Throughout this study only four major categories were examined: (a) psychosis, (b) neurosis, (c) personality disorder, and (d) situational maladjustment. The class factorial structure probably reflects both diagnostic differences and nominal practices. Both must be meaningful if the nomenclature is to be of practical value.

b. Results. The analytic procedure was initiated in an attempt to identify factors that might be used to define clinical decisions and patient outcomes with a stability not available in item oriented procedures. The results are summarized in Table I. The factor analysis of the data indicated the following: (a) all four of the diagnostic classes each contributed to a separate factor; (b) the additional loadings on the factors established clinical severity information; (c) the demographic, behavioral information defined factors independent of the nomenclature.

TABLE 1
FACTOR STRUCTURE FOR DIAGNOSES USING DEMOGRAPHIC
AND BEHAVIORAL INFORMATION

Variable	Loading
Factor 1	
1. Psychosis (0 = no, 1 = yes)	.87
2. Number of days hospitalization	.54
Factor 2	
1. Neurosis (0 = no, 1 = yes)	.94
Factor 3	
1. Character and behavior disorder (0 = no, 1 = yes)	.66
Factor 4	
1. Situational maladjustment (0 = no, 1 = yes)	.82
2. Number of days hospitalization	-.44
3. Able to return to duty (0 = no, 1 = yes)	.66

c. Comment. Diagnostic categories define unique factors in the total clinical picture of a patient. These factors do indicate that the classes can only be weakly defined by historical, demographic data, but that the classes are functionally meaningful in some clinical settings. Once a population has been defined as having psychiatric crises, diagnosis provides sound predictive information to the clinician.

REFERENCES

1. BAHN, A. K. A multi-disciplinary psychosocial classification scheme. *Amer. J. Orthopsychiat.*, 1971, 41(5), 830-838.
2. BERRY, N. H., EDWARDS, D., IORIO, V., & GUNDERSON, E. K. E. A study of Navy and Marine Corps personnel admitted to the psychiatric sick list. Report No. 72-1, Navy Medical Neuropsychiatric Research Unit, San Diego, California, 1972.
3. EDWARDS, D., & GUNDERSON, E. K. E. The use of the *Eighth Revision International Classification of Diseases Adapted for Use in the United States* for psychiatric disorders in the Navy. *Military Med.*, 1971, 136(9), 745-753.
4. FEIGHNER, J. P., ROBINS, E., GUZE, S. B., WOODRUFF, R. A., WINOKUR, G., & MUNZO, R. Diagnostic criteria for use in psychiatric research. *Arch. Gen. Psychiat.*, 1972, 26, 57-63.

5. KATY, M. M., COLE, J. O., & BARTON, W. E. The role and methodology of classification in psychiatry and psychopathology. Publication No. 1584, United States Public Health Service, Washington, D. C.,
6. NATHAN, P. E. Cues, Decisions, and Diagnosis: A Systems-Analysis Approach to Diagnosis of Psychopathology. New York: Academic Press, 1967.

*Navy Medical Neuropsychiatric Research Unit
San Diego, California 92152*

MODEL REWARD AND IMITATION: THE EFFECT OF THE PRESENCE OF THE EXPERIMENTER AND THE MODEL REWARDER*

University of Missouri-Columbia

MARK H. THELEN, NICHOLAS J. REHAGEN, AND T. JOHN AKAMATSU¹

SUMMARY

To assess the effects of the presence of the experimenter (*E*) and/or model-rewarder (*MR*), elementary school children observed a model emit specific sequences on a button pressing task in two separate experiments ($N = 50$ and $N = 80$). The first design was a 2×2 factorial involving the presence-absence of the *E*/*MR* and model reward *vs.* model no-consequences; the second design was a 4×2 factorial with all possible combinations of presence-absence of the *E* and/or *MR*, and model reward *vs.* model no-consequences. It was found that model reward increased imitation only in the condition in which the *E* was present and the *MR* was absent.

A. INTRODUCTION

In the imitation situation in which the entire sequence of modeled behavior is observed before the *S* performs (i. e., nonalternate trials), model reward may not always increase imitation (8). Thelen and Rennie (8) noted that model reward increased imitation in only one of seven studies in which the experimenter (*E*) and/or model rewarder (*MR*) was not present during the imitation measure. When the *E* or *MR* was present, six of 12 studies found model reward effects.

The presence-absence variable may be important to model reward. Bandura (2) has argued that model reward provides the observer with information regarding possible reinforcement contingencies if he should perform the same behavior. It follows that this effect would be enhanced if someone were present to provide reinforcement to the observer during the imitation testing. Hicks (4) found that positive statements about the model's behavior made by a co-observer increased imitation ($p < .10$), but only when the co-observer

* Received in the Editorial Office on May 20, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Now at West Virginia University.

was present during the imitation measure. Grusec (3) exposed children to a video taped model while the *E* made evaluative comments about the model behavior to the child. All *Ss* were tested for imitation in the absence of the *E*. She found no increased imitation as a function of evaluative comments for either neutral or aggressive behavior. While these were not strictly model reward studies, they did involve the presence-absence variable. Kobasigawa (5) found that the presence of the *E/MR* resulted in shorter latencies for touching feminine toys among males who observed a rewarded model, as compared to a no-model control group. This difference was less evident among subjects tested while the *E* was absent. However, the study did not include a no-consequences model group, so the results must be interpreted with caution. Peterson and Whitehurst (6) found that preschool children showed a marked decrement in generalized imitation when the *E* left the situation. The major purpose of the present study was to clarify further the role of the presence-absence dimension in model reward effects on imitation.

A review of the studies in which the *E* and/or *MR* was absent during testing reveals that in all but one study (7) *E* employed socially evaluated behaviors, such as aggression and deviation. Perhaps the failure to find model reward effects in these studies was a function of a disinhibition effect (the absence of negative consequences) rather than a function of the absence of an *E* or *MR*. In the present study a socially neutral response, button pressing, was employed to minimize the influence of social evaluation.

Since there are so little data on the imitation of socially neutral behavior in the absence of an observer during the assessment of imitation, a no-model control group was included. Comparison of the control group with a model no-consequences group tested in the absence of any observer should provide a measure of imitation under conditions of minimal social constraints.

B. EXPERIMENT 1

The presence or absence of the *E/MR* during imitation testing was manipulated to assess the effects of this variable and model reward on imitation. The design was a 2×2 factorial involving presence-absence of the *E/MR*, and model reward and no-consequences conditions.² This design, while similar to that of Hicks (4) and Kobasigawa (5), enabled direct assessment of the effects of presence-absence specifically in conjunction with model

² Even though the person who served as the *MR* in the model reward conditions did not reward the model in the model no-consequences conditions, he is referred to as the *MR* in the model no-consequences conditions.

reward. It was expected that imitation as a function of model reward would be greater when the E/MR was present during the test for imitation.

1. Method

a. Subjects. Twenty-five males and 25 females were selected from the first through third grades of a local public school. Ss were all Caucasian and of about average intelligence. Ss of each age and sex were randomly assigned to one of the four groups, or to a fifth, no-model condition.

b. Apparatus. A video tape apparatus was used to present the model to the Ss. The experimental task apparatus, used earlier by Akamatsu and Thelen (1), consisted of a rectangular box with a clown's face and three buttons mounted on the front. White light bulbs were mounted at the clown's eyes and nose, and these lit when the appropriate button was pushed. These buttons were clearly labeled "1," "2," or "3." A light at the top of this apparatus signaled the beginning of each trial.

c. Procedure. All of the Ss were seen individually by the same male E . The S was told, "We are going to watch a film about a man pushing buttons on a clown. I have a clown just like the one you will see on TV, and after the tape is over, I would like you to push the buttons too. Okay?" The Ss then observed one of two video tapes (model reward or model no-consequences) of an adult male model performing button-pressing sequences. In each condition, the E on the tape told the model that each time the light came on he should push the buttons three times, in any order he wished, and verbalize the appropriate number as he pushed the buttons. In both treatment conditions, the model performed only specified sequences of presses: 1-1-2, 1-1-3, 2-2-1, and 2-2-3. Each of these four sequences was repeated five times in an irregular order, making a total of 20 modeling trials. In the model reward condition, the model received a positive verbal reward following each trial, such as "Those are three good pushes" or "Very good." Ss in the model no-consequences condition viewed a tape of a model performing the same sequence, but no reward was given. The control group viewed no model and thus did not participate in this phase of the experiment.

Following the viewing of the tape, E explained the task to S with the following instructions: "As I told the man on TV, when the top light blinks on, you push the buttons three times. Then wait until the top light comes on again and push the buttons three times again. Do this every time the top light comes on until I tell you to stop. Okay?" Then depending on the presence-absence condition, the E either remained or left the room while S completed 20 trials. All recording was done surreptitiously. The apparatus

was introduced to the control group as a toy. Control Ss were given the same instructions as the other Ss, after which 20 trials were completed.

2. Results

All responses that consisted of two presses on one button followed by one press on a different button were scored as imitative responses because all of the "critical responses" were of this category. The Ss' scores were converted to transformed scores ($y = \sqrt{x + 1/2}$) because of differences in variance between the groups. The group means are presented in Table 1; *t* tests comparing the no-model control group with each of the four experimental groups indicated a significant difference for all comparisons. Of most interest was the comparison of the control group with the model no-consequences group tested in the absence of the *E/MR*, which resulted in a *t* of 3.57 ($p < .01$). There were no appreciable differences between the model reward and model no-consequences groups for the condition of the *E/MR* present or the condition of *E/MR* absent (see Table 1).

C. EXPERIMENT 2

The equivocal results in experiment 1 stimulated further thought concerning the presence-absence variable. In experiment 1 and in the majority of studies employing a nonalternate trials design to examine model reward, the *E* on the modeling film was also the *MR*. In previous studies with exactly the same task and modeled behaviors (9, 10), it was found that when the Ss had an expectancy to perform, model reward Ss imitated significantly more than Ss who observed a model without model reward. However, one critical difference is that, in the previous studies, the *E* and the *MR* were separate individuals, and only the *E* was present during the test for imitation. Since the presence of the *E* and *MR* was confounded in experiment 1, the condition just described as characterizing the previous studies (9, 10) had no counterpart in experiment 1. For this reason, and to assess better the separate and interactive influence of the presence of the *E* and the *MR*, a second experiment was undertaken.

In experiment 2, four conditions of presence-absence (i. e., *E* and *MR* present, only *MR* present, only *E* present, and both absent) and two conditions of model reward (model reward and model no-consequences) were employed. In addition, for half the Ss the *E* and *MR* switched roles (both on the video tape and in testing) in order to reduce possible effects due to the individuals who carried out the study.

1. Method

a. Subjects. Forty males and 40 females were selected from the first through the third grades of a public school. Ss of each sex and age were randomly assigned to one of eight groups.

b. Apparatus and procedure. The design of experiment 2 was the same as experiment 1 except that the roles of the *E* and *MR* were played by two adults (each was the *E* for half of the Ss and the *MR* for half of the Ss). Since the roles of *E* and *MR* were counterbalanced, it was necessary to make two model reward tapes and two model no-consequences tapes. The condition of presence-absence of *E* and/or *MR* involved four groups and was crossed with the presence or absence of model reward. The equipment and instructions for each *S* were identical with those used in experiment 1.

2. Results

Table 1 shows the mean number of critical responses for each of the eight groups reported in transformed scores $y = \sqrt{x + 1/2}$. A three way analysis of variance was carried out on the data with model reward (model reward *vs.* model no-consequences), presence and/or absence of the *E* and *MR* (all possible combinations thereof), and identity of *E* and rewarding person. No significant main effects were found as a function of the identity of the *E* and *MR*. Therefore, the results would seem to apply equally across the two individuals employed in the present study. There was also no main effect

TABLE 1
MEAN NUMBER OF CRITICAL RESPONSES (TRANSFORMED SCORES):
EXPERIMENTS 1 AND 2

Condition	Model reward	Model no-consequences	Control	<i>t</i>
<i>Experiment 1</i>				
Experimenter (<i>E</i>)/Model Rewarder (<i>MR</i>) present	2.20	2.84		1.13(ns)
<i>E</i> / <i>MR</i> absent	2.71	2.27		1.11(ns)
No-model			1.28	
<i>Experiment 2</i>				
<i>E</i> present, <i>MR</i> present	3.41	3.28		.19
<i>E</i> present, <i>MR</i> absent	3.95	2.39		2.46*
<i>E</i> absent, <i>MR</i> present	3.40	3.19		.36
<i>E</i> absent, <i>MR</i> absent	3.48	2.91		.80

Note: Even though the person who served as *MR* in the model reward conditions did not reward the model in the model no-consequences conditions, he is referred to as the *MR* in the model no-consequences conditions.

* $p < .05$.

for the presence-absence variable. The main effect for model reward was significant at a marginal level, with model reward subjects emitting more critical responses than the no-model reward subjects ($F = 3.08$, $df = 1, 64$, $p < .10$).

Planned comparisons were carried out for each of the four presence-absence conditions, comparing model reward subjects with model no-consequences subjects. There were no-model reward effects on imitation when the *E* and *MR* were both present, when the *E* was absent and the *MR* present, or when both the *E* and *MR* were absent (see Table 1). A significant increment in imitation as a function of model reward was found only in the condition in which the *E* was present and the *MR* absent during the test for imitation.

D. DISCUSSION

In experiment 1 it was found that even *Ss* who observed a nonrewarded model and were tested with no other person present imitated significantly more than a no-model control group. This had been previously demonstrated with socially evaluated behaviors, but results based on such behavior are subject to the criticism that disinhibition was critical to imitation. Since the present study employed a socially neutral task, the imitation probably is not attributable to disinhibition. Imitation under such conditions might occur because the situation was novel and the *Ss* had a limited repertoire of relevant experience; thus they may have been especially attentive and responsive to the model behavior.

Experiments 1 and 2 both failed to show increased imitation as a function of model reward under conditions of the presence of the *E* and *MR*, or under conditions of the absence of the *E* and *MR*. Increased imitation as a function of model reward was found only in the condition in experiment 2 in which the *E* was present and the *MR* was absent.

This condition—*E* present and *MR* absent during the test for imitation—was exactly the situation in two previous studies which showed increased imitation as a function of model reward (9, 10). Thus, the particular finding is supported by two separately conducted previous studies.

Why did imitation, as a function of model reward, occur in the condition described above but not in the other three conditions in experiment 2? First, it would appear that neither the singular factor of the presence or absence of the *E*, nor the presence or absence of the *MR* fully explains the data. If such were the case, significant differences in two of the four groups (e. g., in both conditions where the *MR* was present) would be expected. Therefore, it is probable that more than one factor was operating. It is possible that the

presence of the *E* is necessary to sustain imitation as a function of model reward, but the presence of the *MR* may mitigate these effects (since there was no difference in either condition in which the *MR* was present). The *E* may have been seen as the controlling authority, since he established the situation and the guidelines for it. Therefore, the *S* was responsive to his presence and the authority that was projected. On the other hand, if the *MR* was present, there was little evidence of imitation as a function of model reward. Perhaps the silent presence of the *MR* during testing quickly informed the *S* that he would not be rewarded as was the model on the film. A possible explanation, greater extinction among *Ss* tested with the *MR* present, was not supported by an additional analysis. Perhaps extinction of imitative behavior as a function of model reward occurred rapidly and was not detected in the present study.

Thus far the focus has been on the model reward condition and not on the model no-consequences condition. Perhaps in the presence of two silent people (as in the condition in which both were present) the *S* behaved cautiously, since he had observed a model who received no feedback from the same two people. It is interesting to note that, of the four model no-consequences groups, the group in which both *E* and *MR* were present had the highest imitation. The second highest condition was that in which the *E* was absent but the *MR* was present. The *MR*, when present, may be seen as the silent evaluator who said nothing to the model on the video tape and said nothing to the subject. His silence may induce some apprehension in the *S* which leads him to imitate the model out of fear of negative evaluation. Further investigation of a silent observer in the imitation situation is needed for a fuller understanding of the effects of model reward.

Bandura's (2) theoretical notions about the information function of model reward do not readily account for the data in the present study. It was expected that the presence of the *MR*, or perhaps the *E*, would be essential for imitation as a function of model reward. Instead, the absence of the *MR* was necessary for model reward effects. It appears that Bandura's notions about the informational function of model reward need to be elaborated and explored in future research.

REFERENCES

1. AKAMATSU, T. J., & THELEN, M. H. The acquisition and performance of a socially neutral response as a function of vicarious reward. *Devel. Psychol.*, 1971, 5, 440-445.
2. BANDURA, A. Vicarious and self-reinforcement processes. In R. Glaser (Ed.), *The Nature of Reinforcement*. New York: Academic Press, 1971.
3. GRUSEC, J. E. Effect of co-observer evaluations on imitation: A developmental study. *Devel. Psychol.*, 1973, 8, 141.

4. HICKS, D. J. Effect of co-observers' sanctions and adult presence on imitative aggression. *Child Devel.*, 1968, **39**, 303-309.
5. KOBASIGAWA, A. Inhibitory and disinhibitory effects of models on sex-inappropriate behavior on children. *Psychologia: Internat. J. Psychol. in Orient*, 1968, **11**, 86-96.
6. PETERSON, R. S., & WHITEHURST, G. J. A variable influencing the performance of generalized imitative behaviors. *J. Appl. Behav. Anal.*, 1971, **4**, 1-9.
7. ROSEKRANS, M. A. Imitation in children as a function of perceived similarity to a social model and vicarious reinforcement. *J. Personal. & Soc. Psychol.*, 1967, **7**, 307-315.
8. THELEN, M. H., & RENNIE, D. L. The effect of vicarious reinforcement on imitation: A review of the literature. In B. A. Maher (Ed.), *Progress in Experimental and Personality Research*. New York: Academic Press, 1972.
9. THELEN, M. H., MCGUIRE, D., SIMMONDS, D. W., & AKAMATSU, T. J. The effect of model reward on the observer's recall of the modeled behavior. *J. Personal. & Soc. Psychol.*, 1974, **29**, 140-144.
10. THELEN, M. H., RENNIE, D. L., FRYREAR, J. L., & MCGUIRE, D. Expectancy to perform and vicarious reward: Their effects upon imitation. *Child Devel.*, 1972, **43**, 699-703.

Department of Psychology
University of Missouri
Columbia, Missouri 65201

THE EFFECTS OF COUNTERATTITUDINAL COMMUNICATION BEHAVIOR ON LATITUDE OF ACCEPTANCE*

*Division of Communication Studies, University of Florida; and
Department of Communication, Michigan State University*

MICHAEL BURGOON AND GERALD R. MILLER

SUMMARY

The effects of counterattitudinal communication behavior on latitudes of acceptance have not been empirically demonstrated. Moreover, previous research has only compared latitude of acceptance scores of highly polarized people to people holding moderate views on a controversial social issue. There were 106 college subjects used in this study. Highly polarized people were compared to others whose attitudes had moderated as a result of experimental manipulations. Although there were dramatic shifts in prime attitudes among the experimental groups, there were no differences on latitude of acceptance scores as people's attitudes moderated.

A. INTRODUCTION

Researchers have expended considerable effort studying the effects of counterattitudinal encoding on subsequent attitude change. The typical experiment has required persons to produce messages advocating a position contrary to their private opinions. Upon completion of this counterattitudinal task, some attitude measure is obtained; the research consistently demonstrates that a person who encodes a belief-discrepant message will shift his attitude to conform more closely to the advocated position.

A variety of theoretical explanations of the self-persuasion effect can be found in the literature. However, a comprehensive review of over 100 studies using this experimental paradigm indicates that one possible explanation, social judgment theory (5), has been virtually ignored by self-persuasion researchers.¹ This theory posits that people change their attitudes toward issues by assimilating statements that are only slightly belief-discrepant into

* Received in the Editorial Office on May 20, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ For a comprehensive review of the counterattitudinal advocacy literature, see Miller and Burgoon (4).

latitudes of acceptable statements; statements that are very discrepant with the attitude of the person are contrasted with the position he holds and therefore rejected. In trying to operationalize and test some of the postulates of social judgment theory, other researchers have suggested methodological changes in the measurement of attitudes. Diab (2) and McCroskey (3) suggest that the determination of all positions on an issue that are acceptable yields a more meaningful indication of an individual's attitude than the single score determined by most attitude scales. A number of studies using this method support that belief.

The research consistently demonstrates that people who take extreme stands on issues have large latitudes of rejection. No research conclusively demonstrates differences in size of latitude of acceptance varying with extremity of attitudinal position. However, since nearly all of the 100+ studies reviewed used people with polarized attitudes toward the experimental issues (usually all were for or against the specific topic), these counterattitudinal advocacy studies might have been conducted on people with relatively small latitudes of acceptance. The usual published self-persuasion study reports people becoming more moderate following the production of a counterattitudinal message. Along with this moderation in prime attitudinal position, the postencoding subjects might have had a wider latitude of acceptance. Such a finding would add specificity to social judgment and counterattitudinal advocacy theories.

The present study sought to determine if counterattitudinal communication behavior enlarges a communicator's latitude of acceptance. If, when people take more moderate positions, they also demonstrate a larger latitude of acceptance, strong support would be shown for social judgment theory as an explanation of attitude change following counterattitudinal communication. That is, people would be seen to change their attitude of increasing the latitude of acceptance and, in turn, shifting their prime attitudes within that enlarged latitude.

B. METHOD

The data from 106 subjects who took part in a counterattitudinal advocacy study by Burgoon and Miller (1) were used in this investigation. All of the subjects were undergraduates in a business communication course at Michigan State University.

Two weeks before the actual experiment, subjects randomly assigned to three experimental and one control condition were administered a pretest questionnaire, ostensibly to solicit student opinion on possible issues to be

used in a project for another class. The instrument used to measure attitude toward the issues was a seven-interval scale with the anchors *excellent*, *good*, *fair*, *neutral*, *poor*, *bad*, and *terrible* [see Burgoon and Miller (1)]. Since the original scale assigns negative values to several of these anchors, a constant of 4.1 was added to each scale value, producing a seven-interval scale with a range of 1.0 (least favorable toward issue) to 7.8 (most favorable toward issue). Subjects were instructed to place an *A* next to the anchor that best represented their attitude toward each issue; in addition they were told to place an *X* by each anchor "they could accept." On the basis of pretest results, mandatory on-campus residency of undergraduates was selected as the issue to be used, since all subjects were extremely opposed to the concept.

At the experimental session counterattitudinal encoding took place, and posttest attitude and latitude of acceptance measures were obtained. The counterattitudinal encoding task required subjects to prepare a persuasive message arguing for mandatory on-campus residency for all undergraduates. Subjects in the fourth experimental group were forced to create a message that used language that strongly argued for the counterattitudinal topic. The third group was allowed to use moderately intense language to create the message, while the second experimental group used language low in intensity. In summary, the three experimental groups were forced to argue in favor of mandatory on-campus residency. However, how strongly they were forced to argue in opposition to their private beliefs differed among the three experimental groups. The control group did not prepare a counterattitudinal message, but only took the pretest and posttest attitude measures.

The data obtained were ideal for testing extensions of social judgment theory. The pretest and posttest mean attitude scores are shown in Table 1. All four groups were originally strongly opposed to the issue. The third and fourth experimental groups demonstrated a typical self-persuasion effect and were near the neutral point (neutral = 4.0) after counterattitudinal encoding.

Given that this experiment began with people possessing polarized attitudes and extremely narrow latitudes of acceptance, and reporting sizeable attitudinal shifts toward neutrality after counterattitudinal communication, conditions were optimal for testing the possibility of increased size of latitudes of acceptance as people's attitudes become moderate.

C. RESULTS

Latitude of acceptance was computed by subtracting the lowest valued statement from the highest. The pretest latitude of acceptance scores were submitted to a one-way analysis of variance which revealed that the means

were not significantly different ($F < 1$, $df = 3/102$). Pretest through posttest latitude of acceptance change scores were analyzed by a simple analysis of variance. The results shown in Table 1 indicate no difference in latitude of acceptance between groups following counterattitudinal communication ($F = 1.56$, $df = 3/102$).

The results are contradictory to expectations. Although there was a great amount of moderation in attitudes by two experimental groups, no subsequent changes in latitude of acceptance occurred.

D. DISCUSSION

Diab (2) and McCroskey (3) had previously not been able to support their predictions that latitude of acceptance increases as attitudes moderate. However, their research had always tested groups of polarized people and compared them to other people with moderate attitudes. The present investigation sought to determine if people who are changing toward moderation do assimilate more acceptable statements into a larger latitude of acceptance.

Although the number of acceptable statements did not increase as attitudes became more moderate, there were definite changes in the nature of those statements considered acceptable. For example in Experimental IV, the subjects began thinking the issue was *terrible*, accepting that it was *bad*; after counterattitudinal communication they were *neutral* toward the issue and accepted that it was *poor* and *fair*. The attitude change was so drastic that instead of assimilating more statements, the entire latitude of acceptance

TABLE 1
ATTITUDE, LATITUDE OF ACCEPTANCE, AND CHANGE SCORES
FOR SUBJECTS IN THE EXPERIMENT

Group	Pretest mean	Posttest mean	Change score
<i>Attitude score</i>			
Experimental IV	1.40	3.90	2.50 _{ab}
Experimental III	1.47	3.58	2.11 _{bc}
Experimental II	1.27	2.64	1.37 _{cd}
Control I	1.63	1.91	.28 _{de}
<i>Latitude of acceptance scores</i>			
Experimental IV	1.58	1.98	.37
Experimental III	1.33	1.61	.28
Experimental II	1.54	1.60	.06
Control I	1.41	1.82	.41

Note: Means with a common letter subscript do not differ significantly from each other.

was shifted toward moderation. In groups I and II there were no significant shifts in either attitude or latitude of acceptance.

This additional lack of support for one crucial derivation of social judgment theory suggests that at least in the self-persuasion paradigm, attitudes are not changed by increasing the number of acceptable statements in a linear manner. The analyses of the combined attitude change/latitude of acceptance data in this study indicate that attitudes can undergo dramatic changes without affecting the number of statements a person is willing to accept about an issue. Since this study compared the same group of people as they changed, rather than comparing separate groups, it seems to cast general doubt on predictions that extremity of attitudinal position is related to size of latitude of acceptance.

REFERENCES

1. BURGOON, M., & MILLER, G. R. Prior attitude and language intensity as predictors of message style and attitude change following counterattitudinal advocacy. *J. Personal. & Soc. Psychol.*, 1971, **20**, 246-253.
2. DIAB, L. N. Studies in social attitudes: I. Variations in latitudes of acceptance and rejection as a function of varying positions on a controversial social issue. *J. Soc. Psychol.*, 1965, **67**, 283-295.
3. McCROSKEY, J. C. Latitude of acceptance and the semantic differential. *J. Soc. Psychol.*, 1968, **74**, 127-132.
4. MILLER, G. R., & BURGOON, M. *New Techniques of Persuasion*. New York: Harper & Row, 1973.
5. SHERIF, C. W., SHERIF, M., & NEBERGALL, R. F. *Attitude and Attitude Change*. Philadelphia: Saunders, 1965.

Division of Communication Studies
University of Florida
Gainesville, Florida 32601

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

IRVIN L. CHILD
Yale University

LEONARD W. DOOB
Yale University

CHARLES K. FERGUSON
University of California,
Los Angeles

FRANK A. GELDARD
Princeton University

GEORGE M. GUTHRIE
Pennsylvania State
University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

If this space should be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special

edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

DAVID HOTHERSALL
Ohio State University

DARWIN P. HUNT
New Mexico State
University

J. McV. HUNT
University of Illinois

JEROME KAGAN
Harvard University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

ARTHUR J. RIOPELLE
Louisiana State University

WARREN H. TEICHNER
New Mexico State
University

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

VOLUME 87

1974

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Published at 2 Commercial Street, Provincetown, Mass.

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02566

AUTHOR INDEX

Akamatsu, T. John	311	McWilliams, Jettie M.	137
Allen, Peter G.	103	Merlis, Sidney	123
Armstrong, Barbara N.	293	Miller, Gerald R.	319
Bailey, Kent G.	129	Morin, Stephen F.	237
Bermudez, John H.	83	Norman, Leonard	29
Berry, Gene A.	83	Nowicki, Stephen	263
Berry, N. H.	305	Ohlson, E. LaMonte	59
Bucky, Steven F.	305	Orloff, Henry	45
Burgoon, Michael	319	Orpen, Christopher	3
Butterfield, Rhonda	225	Prather, Dirk C.	83
Chevrette, John M.	203	Perkins, David Cullen	107
Clarke, Alfred C.	279	Rehagen, Nicholas J.	311
Duke, Marshall P.	263	Ricca, Elizabeth	123
Edwards, Bill C.	137	Riechmann, Sheryl Wetter	213
Edwards, Darrel	305	Rini, Richard J.	45
Edwards, Maxine	143	Roodin, Paul A.	119
Edwards, Shirley A.	97	Rutkin, Richard	231
Fichman, J. Susan	305	Scheidt, Fredrick J.	21
Fracchia, John	123	Schneider, Frank W.	71
Friedman, Howard	177	Scotzin, Martha M.	293
Fry, P. S.	193	Sheppard, Charles	123
Geen, Russell G.	111	Silverman, Bernie I.	89
Gilley, Hoyt Melvin	107	Spielberg, Lee	231
Gough, Harrison G.	183	Stinnett, Nick	143
Grasha, Anthony F.	213	Stonner, David	111
Hackman, Roy B.	253	Strümpfer, D. J. W.	269
Hamel, Robert F.	171	Tebbs, Robert B.	83
Hartley, Craig S.	129	Thelen, Mark H.	311
Hartnett, John J.	129	Thompson, Kenrick S.	279
Havelick, Raymond J., Jr.	53	Tolson, Homer	203
Hjelle, Larry A.	225	VanDeventer, Jon	209
Jones, Reginald L.	237	Vane, Julia R.	53
Kanungo, Rabindra N.	29	Vanmastrigt, Loretta A.	71
Keat, Donald B., II	253	Vaught, Glen M.	119
Kippel, Gary M.	245	Walmsley, D. J.	9
Lerner, Richard M.	45	Webb, James T.	209
McCarrey, Michael W.	97	Whitmer, Marvin	89
McManis, Donald L.	159		

TABLE OF CONTENTS

An environmental theory of job satisfaction	3
BY CHRISTOPHER ORPEN	
Emotional involvement and subjective distance: A modification of the inverse square root law	9
BY D. J. WALMSLEY	
Deviance, power, and the occult: A field study	21
BY FREDRICK J. SCHEIDT	
Effects of direct and indirect praise and blame on attribution	29
BY RABINDRA N. KANUNGO AND LEONARD NORMAN	
The relation of attention to social cue discrimination, achievement, and adjustment in the elementary school classroom	45
BY RICHARD M. LERNER, RICHARD J. RINI, AND HENRY ORLOFF	
Race, competency, and level of achievement: Relationship to modeling in elementary school children	53
BY RAYMOND J. HAVELICK, JR., AND JULIA R. VANE	
The effects of the female-based family and birth order on the ability to self-disclose	59
BY E. LAMONTE OHLSON	
Adolescent-preadolescent differences in beliefs and attitudes about cigarette smoking	71
BY FRANK W. SCHNEIDER AND LORETTA A. VANMASTRIGT	
The effect of valence on performance in a conservation task	83
BY JOHN H. BERMUDEZ, DIRK C. PRATHER, GENE A. BERRY, AND ROBERT B. TEBBS	
Astrological indicators of personality	89
BY BERNIE I. SILVERMAN AND MARVIN WHITMER	
Summer job preferences	97
BY SHIRLEY A. EDWARDS AND MICHAEL W. MCCARREY	
The effect of interpersonal censure on the cognitive performance of acute process and reactive schizophrenic patients	103
BY PETER G. ALLEN	
Hostile verb use by youthful male prisoners with single vs. multiple offenses	107
BY HOYT MELVYN GILLEY AND DAVID CULLEN PERKINS	
Similarity, conditioned affect, and interpersonal attraction	111
BY RUSSELL G. GEEN AND DAVID STONNER	
Birth order, volunteering, and status of the experimenter: A negative note	119
BY PAUL A. ROODIN AND GLEN M. VAUGHT	
Psychological needs of suburban male heroin addicts	123
BY CHARLES SHEPPARD, ELIZABETH RICCA, JOHN FRACCHIA, AND SIDNEY MERLIS	
Body height, position, and sex as determinants of personal space	129
BY JOHN J. HARTNETT, KENT G. BAILEY, AND CRAIG S. HARTLEY	

Expressor sex, perceiver personality, and cognitive perception	137
BY BILL C. EDWARDS AND JETTIE M. MCWILLIAMS	
Perceptions of college students concerning alternate life styles	143
BY MAXINE EDWARDS AND NICK STINNETT	
Effects of peer-models <i>vs.</i> adult-models and social reinforcement on intentionality of children's moral judgments	159
BY DONALD L. MCMANIS	
Female subjective and pupillary reaction to nude male and female figures	171
BY ROBERT F. HAMEL	
Interrelation of two types of immediate memory in the aged	177
BY HOWARD FRIEDMAN	
A 24-item version of the Miller-Fisk sexual knowledge questionnaire	183
BY HARRISON G. GOUGH	
The development of differentiation in self-evaluations: A cross-cultural study	193
BY P. S. FRY	
Changes in attitudes toward physical activity as a result of individualized exercise prescription	203
BY HOMER TOLSON AND JOHN M. CHEVRETTE	
Manifest hostility as modified by the <i>K</i> and <i>So-R</i> scales of the MMPI	209
BY JON VANDEVENTER AND JAMES T. WEBB	
A rational approach to developing and assessing the construct validity of a student learning style scales instrument	213
BY SHERYL WETTER RIECHMANN AND ANTHONY F. GRASHA	
Self-actualization and women's attitudes toward their roles in contemporary society	225
BY LARRY A. HJELLE AND RHONDA BUTTERFIELD	
The effects of peer <i>vs.</i> adult frustration on boys of middle childhood	231
BY LEE SPIELBERG AND RICHARD RUTKIN	
Social comparison of abilities in blind children and adolescents	237
BY STEPHEN F. MORIN AND REGINALD L. JONES	
Information feedback schedules, interpolated activities, and retention	245
BY GARY M. KIPPEL	
A method of clustering persons' profiles	253
BY DONALD B. KEAT, II, AND ROY B. HACKMAN	
Locus of control and achievement—The confirmation of a theoretical expectation	263
BY MARSHALL P. DUKE AND STEPHEN NOWICKI	
Some correlates of Mehrabian's scales of Affiliative Tendency and Sensitivity to Rejection	269
BY D. J. W. STRÜMPFER	
Photographic imagery and the Vietnam war: An unexamined perspective	279
BY KENRICK S. THOMPSON AND ALFRED C. CLARKE	
Intergenerational comparison of attitudes toward basic life concepts	293
BY BARBARA N. ARMSTRONG AND MARTHA M. SCOTZIN	

A consideration of the state of the art of diagnosis in real clinical settings . . .	305
BY DARREL EDWARDS, J. SUSAN FICHMAN, STEVEN F. BUCKY, AND N. H. BERRY	
Model reward and imitation: The effect of the presence of the experimenter and the model rewarder	311
BY MARK H. THELEN, NICHOLAS J. REHAGEN, AND T. JOHN AKAMATSU	
The effects of counterattitudinal communication behavior on latitude of acceptance	319
BY MICHAEL BURGOON AND GERALD R. MILLER	

ABBREVIATIONS OF WORDS USED IN THE TITLES OF JOURNALS

(One-word titles are never abbreviated. The word "the" is not used, nor its equivalent in any other language. The word "of" or its equivalent in other languages is used only to discriminate what would otherwise be identical titles in different languages. The word "and" is always used, but indicated by "&" in the Roman alphabet. Only English words are indicated here, but the corresponding words in other languages should receive a corresponding abbreviation. All abbreviations and all one-word titles should be in italics.)

Abnormal	<i>Abn.</i>	Japanese	<i>Jap.</i>
Abstracts	<i>Abst.</i>	Journal	<i>J.</i>
American	<i>Amer.</i>	Mathematical	<i>Math.</i>
Anatomy	<i>Anat.</i>	Measurement	<i>Meas.</i>
Animal	<i>Anim.</i>	Medical	<i>Med.</i>
Applied	<i>Appl.</i>	Mental	<i>Ment.</i>
Archives	<i>Arch.</i>	Monographs	<i>Monog.</i>
Association	<i>Assoc.</i>	Neurology	<i>Neurol.</i>
Attitude	<i>Attit.</i>	Opinion	<i>Opin.</i>
Australian	<i>Aust.</i>	Orthopsychiatry	<i>Orthopsychiat.</i>
Behavior	<i>Behav.</i>	Personality	<i>Personal.</i>
British	<i>Brit.</i>	Personnel	<i>Person.</i>
Bulletin	<i>Bull.</i>	Philosophy	<i>Philos.</i>
Bureau	<i>Bur.</i>	Physics	<i>Phys.</i>
Canadian	<i>Can.</i>	Physiology	<i>Physiol.</i>
Character	<i>Charac.</i>	Proceedings	<i>Proc.</i>
Children	<i>Child.</i>	Psychiatry	<i>Psychiat.</i>
Chinese	<i>Chin.</i>	Psychoanalysis	<i>Psychoanal.</i>
Clinical	<i>Clin.</i>	Psychology	<i>Psychol.</i>
College	<i>Coll.</i>	Psychosomatic	<i>Psychosomat.</i>
Comparative	<i>Comp.</i>	Quarterly	<i>Quart.</i>
Consulting	<i>Consult.</i>	Religious	<i>Relig.</i>
Contributions	<i>Contrib.</i>	Research	<i>Res.</i>
Development	<i>Devel.</i>	Review	<i>Rev.</i>
Educational	<i>Educ.</i>	School	<i>Sch.</i>
Experimental	<i>Exper.</i>	Science	<i>Sci.</i>
General	<i>Gen.</i>	Social	<i>Soc.</i>
Genetic	<i>Genet.</i>	Statistics	<i>Stat.</i>
Indian	<i>Ind.</i>	Studies	<i>Stud.</i>
Industrial	<i>Indus.</i>	Teacher	<i>Teach.</i>
International	<i>Internat.</i>	University	<i>Univ.</i>
Italian	<i>Ital.</i>		

Preparation of Manuscripts for The Journal Press

GENERAL INSTRUCTIONS

1. The proper sequence for the parts of your submitted manuscript is as follows: (a) text, (b) references, (c) footnotes, (d) tables, (e) figures, and (f) figure legends. However, monographs start with a table of contents and may have an acknowledgment page before the text and an appendix immediately after the text.
2. Use heavy typewriter paper, $8\frac{1}{2} \times 11$ inches, double-space *all* lines, and leave margins for editorial work. Do not use onionskin, odd sizes, and abrasive or wax finishes.
3. Submit original typewritten version and one copy. Retain second copy for proofing.
4. Retype any page on which written corrections have been made.
5. Do not begin a sentence with a numeral.
6. A summary at the beginning of the text is required for articles over 500 words.
7. Each quotation should indicate the page number of the original source. The original publisher must give permission for lengthy quotations and use of tables or figures.
8. Do not fold your manuscript.
9. Enclose a submission letter, with a statement that the manuscript is not under consideration elsewhere. If you are unknown to the Editors, kindly give your credentials.

FORMAT AND SPECIFIC INSTRUCTIONS

A. TEXT DIVISIONS

I. THE TITLES OF JOURNAL ARTICLES AND THE MAJOR SUBDIVISIONS OF MONOGRAPHS ARE PRINTED IN TEN-POINT CAPS CENTERED ON THE PAGE

THE NEXT SUBDIVISION TITLE IS PRINTED IN CAPS AND SMALL CAPS CENTERED ON THE PAGE

1. *Then Italics, with Principal Words, Upper and Lower Case, Centered on the Page*
- a. *Then italics, upper and lower case, 1-em run-in side head.*
 - (1). *Then italics, upper and lower case, 2-em run-in side head.*
 - (a). *Then italics, upper and lower case, 3-em run-in side head.*

[Further subdivision should be merged into the text without marginal indentation, and should be numbered with small letters.]

B. REFERENCES

References should be arranged in alphabetical order by author, numbered and referred in the text by number (2). Double-space!

The proper form of a book reference is as follows:

DOE, J. The Preparation of Manuscripts. New York: Holt, 1963. Pp. 400-418.

The proper form of a journal reference is as follows:

DOE, J. The preparation of manuscripts. *J. Gen. Psychol.*, 1963, 68, 450-462.

If in the text it is desirable to refer to a page, thus (2, p. 45).

C. FOOTNOTES

Use as few as possible and number consecutively in the text thus.¹

¹ Footnote (on the separate footnote page). Double-space!

D. TABLES

Each table should be typed on a separate sheet and should be Arabic numbered (Table 2). Each column requires a heading. Vertical lines should be avoided. Mention tables consecutively in the text and indicate approximate insertion points.

E. FIGURES

Figures should be submitted as glossy prints of the approximate size for final reproduction (ordinarily $4\frac{1}{2}$ inches in width). Lettering and lines should be sharp and clean. Figures should be Arabic numbered (Figure 2) in the text, and have consecutive mention and approximate insertion points. Each figure requires a legend, but all legends should be submitted double-spaced on a separate Figure Legends page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

September, 1974
Volume 88, First Half

Founded in 1935 by Carl Murchison

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

IRVIN L. CHILD
Yale University

LEONARD W. DOOB
Yale University

CHARLES K. FERGUSON
University of California,
Los Angeles

FRANK R. GELDARD
Princeton University

GEORGE M. GUTHRIE
Pennsylvania State
University

ERNEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

If this space be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special
edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

DAVID HOTHERSALL
Ohio State University

DARWIN P. HUNT
New Mexico State
University

J. McV. HUNT
University of Illinois

JEROME KAGAN
Harvard University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

ARTHUR J. RIOPELLE
Louisiana State University

WARREN H. TEICHER
New Mexico State
University

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass.
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02668

Microfiche Now Available

Back Issues

While continuing to maintain a complete inventory of paper-bound back issues for all five journals—some reprinted and some original editions—The Journal Press is now offering microfiche (negative silverfiche) versions for all but the last two calendar years: i.e., Volume 1 through 1970 volumes are available immediately; 1971 volumes will first be available in January 1974; 1972 volumes, in January 1975, etc. The minimum order is for one volume. The following rates are in effect: Paper-bound—single numbers, \$9.00; microfiche, not available. Paper-bound—two-part volumes, \$18.00; microfiche, \$6.00. Paper-bound—three-part volumes, \$27.00; microfiche, \$9.00. Paper-bound—four-part and over-four-part volumes, \$36.00; microfiche, \$12.00. The only exceptions (special issues) are starred below.*

		PRICE PER VOLUME		PRICE THROUGH 1970	
VOLUMES	DATES	PAPER	MICRO- FICHE	PAPER	MICRO- FICHE
<i>Journal of Genetic Psychology</i> (Pedagogical Seminary)					
1-117	1891-1970			\$2754.00	\$895.00
1-4	1891-April 1897	\$27.00	\$ 9.00		
5-37	July 1897-1930	36.00	12.00		
38*	1930	18.00	6.00		
39	1931	36.00	12.00		
40 and later	1932-	18.00	6.00		
<i>Genetic Psychology Monographs</i>					
1-82	1926-1970			1872.00	620.00
1-22	1926-1940	36.00	12.00		
23 and later	1941-	18.00	6.00		
<i>Journal of General Psychology</i>					
1-83	1928-1970			1566.00	520.00
1-3	1928-1930	36.00	12.00		
4*	1930	18.00	6.00		
5	1931	36.00	12.00		
6 and later	1932-	18.00	6.00		
<i>Journal of Social Psychology</i>					
1-82	1930-1970			1656.00	550.00
1-10	1930-1939	36.00	12.00		
11 and later	1940-	18.00	6.00		
<i>Journal of Psychology</i>					
1-76	1935/36-1970			1368.00	450.00
1 and later	1935/36-	18.00	6.00		

A mailing charge of \$0.30 per volume is made for foreign delivery of paper editions. Domestic paper mailings carry no postage charge. Prepaid foreign and domestic microfiche orders are also postage free; other orders will be billed for costs. Remittances should be by check or money order payable in U.S. funds on a United States bank, with no bank commission deducted. Advance payment is required from all individuals and from foreign purchasers. Microfilm versions and special bindings are not available. Microfiche orders only may be sent directly to The Journal Press or to Johnson Associates Inc., 175 Fifth Avenue, New York, New York 10010.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Notice: All copyrighted material reprinted or otherwise reproduced from Journal Press publications should be given an appropriate acknowledgment. No permission is necessary for brief quotations and originally worded abstracts (less than 300-word total or 10 percent of length, whichever is least, for any one article). Written permission is required for reprinting or copying tables, figures, summaries, entire articles, or substantial portions thereof; such permission normally carries a charge of \$5 per page and is contingent upon agreement and possible stipulation of the original author or authors. Estate permission can be required. Authors requesting use of their own material are not charged. Fees may be waived for limited-copy instructional usage and for government periodicals. Special rates can be applied when justified.

The Journal of Psychology

Founded in 1935 by Carl Murchison

The Journal of Psychology was founded at the request of many psychologists throughout the world for the purpose of establishing a medium in which publication shall be immediate and in which other publication experiments may be carried out.

(1). The subscription price is \$39.00 per annum, \$18.00 per volume, \$9.00 per issue (three volumes per year).

(2). Manuscripts may be sent to any member of the Editorial Board or may be sent directly to The Journal Press. The lag in publication should not be more than a few weeks.

(3). The author will receive 200 reprints of his paper, and subscribers will receive the accumulated publications bound into half-volume units. The second half of each volume will contain the title page and table of contents for that volume. Each half-volume unit will be mailed to the subscribers at its stated date.

(4). Each author will be charged the manufacturing costs of any zincs, halftone cuts, tables, or equations. Excessive use of special fonts (references, footnotes, quotations, appendices) will also be charged.

(5). The publication charges are as follows:

1 to 4 pages	\$60.00
5 to 8 "	120.00
9 to 12 "	180.00
13 to 16 "	240.00
17 to 20 "	300.00
21 to 24 "	360.00
25 to 28 "	420.00
29 to 32 "	480.00

These charges are subject to adjustment as justified.

(6). The accumulated units will be mailed to subscribers bimonthly: January, March, May, July, September, and November. The units may vary in size to accommodate publication needs.

All back issues are available. See announcement on inside front cover.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Journal of Genetic Psychology

Founded by G. Stanley Hall in 1891; reorganized by Carl Murchison in 1925

Quarterly, beginning with March. Devoted to developmental and clinical psychology, with briefly reported Replications and Refinements and occasional book reviews. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of General Psychology

Founded in 1927 by E. B. Titchener and Carl Murchison

Quarterly, beginning with January. Devoted to experimental, physiological, and comparative psychology, with briefly reported Replications, Refinements, and Comments. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of Social Psychology

Founded in 1929 by John Dewey and Carl Murchison

Bimonthly, beginning with February. Devoted to studies of persons in group settings and of culture and personality; special attention to cross-cultural articles and notes, to field research, and to briefly reported Replications and Refinements. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Three volumes annually. Per annum, \$39.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Each author will receive 100 unbound reprints gratis. Additional reprints may be purchased at a nominal cost when the author returns page-proof.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Club Rate for Five International Psychological Journals

	PER ANNUM
THE JOURNAL OF GENETIC PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
GENETIC PSYCHOLOGY MONOGRAPHS (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF GENERAL PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF SOCIAL PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
THE JOURNAL OF PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
	TOTAL \$156.00

TEACHERS AND STUDENTS EDITION, *Restricted Sale* \$50.00

The *Teachers and Students Edition* is open to any individual psychologist, teacher, student, or physician but requires an agreement that the edition will not be offered for sale till after five years from publication and an agreement that the edition will not be substituted for an institutional subscription. Write for our Teachers and Students contract card.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Genetic Psychology Monographs

Founded in 1925 by Carl Murchison

Quarterly, beginning with February. Devoted to developmental and clinical psychology. Each number one or more complete researches. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

NOTICE. Effective immediately we offer prior publication for certain selected monographs. Charges will be based on the announced rates for The Journal of Psychology. Regular monographs will carry no page charge for the first 50 pages, but for all pages above 50 there will be a charge of \$10.00 per page. Manufacturing costs of any zincs, halftone cuts, tables, or equations will be charged to authors, as will excessive use of special fonts. Two hundred reprints of each monograph will be supplied free of charge.

The listing of monographs for 1926 through 1963 will be printed in the first half of each volume of all five journals. Monographs published after 1963 will be listed in the second half of each volume.

VOLUME 1—1926

- Performance tests for children of pre-school age—R. STUTSMAN
An experimental study of the eidetic type—H. KLÄVER
& 4. A study of natio-racial mental differences—N. D. M. HIRSCH
A psychological study of juvenile delinquency by group methods—J. W. BRIDGES AND K. M. B. BRIDGES
The influence of puberty praecox upon mental growth—A. GESELL

VOLUME 2—1927

- & 2. The mind of a gorilla—R. M. YERKES
The role of eye-muscles and mouth-muscles in the expression of the emotions—K. DUNLAP
Family similarities in mental-test abilities—R. R. WILLOUGHBY
Coordination in the locomotion of infants—L. H. BURNSIDE
The mind of a gorilla: Part II. Mental development—R. M. YERKES

VOLUME 3—January-June, 1928

- An experimental study of the olfactory sensitivity of the white rat—J. R. LIGGETT
A photographic study of eye movements in reading formulae—M. A. TINKER
An experimental study of the East Kentucky mountaineers—N. D. M. HIRSCH
Responses of foetal guinea pigs prematurely delivered—G. T. AVERY
Objective differentiation between three groups in education (teachers, research workers, and administrators)—M. B. JENSEN

The effect of segregation on the sex behavior of the white rat as measured by the obstruction method—M. JENKINS

VOLUME 4—July-December, 1928

- Observation and training of fundamental habits in young children—E. A. BOTT, W. E. BLATZ, N. CHANT, AND H. BOTT
& 3. Determination of a content of the course in literature of a suitable difficulty for junior and senior high school students—M. C. BURCH
& 5. Methods for diagnosis and treatment of cases of reading disability—M. MONROE
The relative effectiveness of lecture and individual reading as methods of college teaching—E. B. GREENE

VOLUME 5—January-June, 1929

- The age factor in animal learning: I. Rats in the problem box and the maze—C. P. STONE
The effect of delayed incentive on the hunger drive in the white rat—E. L. HAMILTON
Which hand is the eye of the blind?—J. M. SMITH
The effect of attitude on free word association-time—A. G. EKDAHL
The localization of tactual space: A study of average and constant errors under different types of localization—L. E. COLE
The effects of gonadectomy, vasotomy, and injections of placental and orchic extracts on the sex behavior of the white rat—H. W. NISSEN

VOLUME 6—July-December, 1929

- Learning and growth in identical infant twins: An experimental study by the method of co-twin control—A. GESELL AND H. THOMPSON
The age factor in animal learning: II. Rats on a multiple light discrimination box and a difficult maze—C. P. STONE
The acquisition and interference of motor habits in young children—E. MCGINNIS
A vocational and socio-educational survey of graduates and non-graduates of small high schools of New England—A. D. MUELLER
& 6. A study of the smiling and laughing of infants in the first year of life—R. W. WASHBURN

VOLUME 7—January-June, 1930

- Tensions and emotional factors in reaction—E. DUFFY
Teacher influence on class achievement: A study of the relationship of estimated teaching ability to pupil achievement in reading and arithmetic—H. R. TAYLOR
& 4. A study of the effect of inverted retinal stimulation upon spatially coordinated behavior—P. H. EWERT
A study of the mental development of children with lesion in the central nervous system—E. E. LORD
An experimental study upon three hundred school children over a six-year period—N. D. M. HIRSCH

VOLUME 8—July-December, 1930

- The amount and nature of activities of newborn infants under constant external stimulating conditions during the first ten days of life—O. C. IRWIN
Race and social differences in performance tests—S. D. PORTEUS, *et al.*
Language and growth: The relative efficacy of early and deferred vocabulary training, studied by the method of co-twin control—L. C. STRAYER
Eye-movements and optic nystagmus in early infancy—J. M. MCGINNIS
6. Reactions of kindergarten, first-, and second-grade children to constructive play materials—L. FARWELL

VOLUME 9—January-June, 1931

2. The status of the first-born with special reference to intelligence—H. H. HSIAO
4. An experimental study of bright, average, and dull children at the four-year mental level—H. P. DAVIDSON
An historical, critical, and experimental study of the Seashore-Kwalwasser test battery—P. R. FARNSWORTH
A comparison of difficulty and improvement in the learning of bright and dull children in reproducing a descriptive selection—F. T. WILSON

VOLUME 10—July-December, 1931

- A comparative study of a group of southern white and negro infants—M. B. MCGRAW
3. An experimental study of prehension in infants by means of systematic cinema records—H. M. HALVERSON
The limits of learning ability in kittens—A. M. SHUKY
6. The effect of habit interference upon performance in maze learning—O. W. ALM

VOLUME 11—January-June, 1932

- General factors in transfer of training in the white rat—T. A. JACKSON
The effect of color on visual apprehension and perception—M. A. TINKER
The reliability and validity of maze experiments with white rats—R. LEEPER
A critical study of two lists of best books for children—F. K. SHUTTLEWORTH
6. Measuring human energy cost in industry: A general guide to the literature—R. M. PAGE

VOLUME 12—July-December, 1932

- Family resemblances in verbal and numerical abilities—H. D. CARTER
The development of fine prehension in infancy—B. M. CASTNER
4. The growth of adaptive behavior in infants: An experimental study at seven age levels—H. M. RICHARDSON
6. Differential reactions to taste and temperature stimuli in newborn infants—K. JENSEN

VOLUME 13—January-June, 1933

- A critique of sublimation in males: A study of forty superior single men—W. S. TAYLOR
A study of the nature, measurement, and determination of hand preference—H. L. KOCH, *et al.*
The growth and decline of intelligence: A study of a homogeneous group between the ages of ten and sixty—H. E. JONES AND H. S. CONRAD
The relation between the complexity of the habit to be acquired and the form of the learning curve in young children—M. L. MATTHEWSON
Eating habits in relation to personality development of two- and three-year-old children: A study of sixty-nine children in two nursery schools—A. A. ELIOT
Coordinating mechanisms of the spinal cord—O. C. INGEBRITSEN

Genetic Psychology Monographs (continued)

VOLUME 14—July-December, 1933

1. Mental growth during the first three years: A developmental study of sixty-one children by repeated tests—N. BAYL
2. A study of triplets: including theories of their possible genetic relationships—F. N. ANDERSON AND N. V. SCHEIDEMA
3. The objective measurement of emotional reactions—J. V. GASKILL
4. Development of behavior in the fetal cat—J. D. CORONIOS
5. A study of certain language developments of children in grades four to twelve, inclusive—L. L. LABRANT
6. The effect of early and delayed practice on memory and motor performances studied by the method of control—J. R. HILGARD

VOLUME 15—January-June, 1934

1. Studies in the psychology of tone and music—P. R. FARNSWORTH
2. Motor learning of children in equilibrium in relation to nutrition—E. L. BEEBE
3. Discrimination limens of pattern and size in the goldfish *Carassius auratus*—J. B. ROWLEY
4. Limits of learning ability in the white rat and the guinea pig—B. F. RIESS
- 5 & 6. The limits of learning ability in rhesus monkeys—H. A. FIELD

VOLUME 16—July-December, 1934

1. A statistical study of ratings on the California Behavior Inventory for Nursery-School Children—H. S. CONRAD
2. An eye-movement study of objective examination questions—A. FRANDSEN
3. An experimental study of constitutional types—O. KLINEBERG, S. E. ASCH, AND H. BLOCK
4. The development of a battery of objective group tests of manual laterality, with the results of their application 1300 children—W. N. DUNOST
- 5 & 6. An experimental study in the prenatal guinea-pig of the origin and development of reflexes and patterns behavior in relation to the stimulation of specific receptor areas during the period of active fetal life—L. CARMICHAEL

VOLUME 17—January-December, 1935

1. Organization of behavior in the albino rat—R. L. THORNDIKE
2. Brightness discrimination in the rhesus monkey—M. P. CRAWFORD
3. The limits of learning ability in cebus monkeys—A. M. KOCH
4. Nature-nurture and intelligence—A. M. LEAHY
5. On intelligence of epileptic children—E. B. SULLIVAN AND L. GAHAGAN
6. A study of the play of children of preschool age by an unobserved observer—D. L. COCKRELL

VOLUME 18—January-December, 1936

1. Sex differences in variational tendency—Q. MCNEMAR AND L. M. TERMAN
2. The process of learning to dress among nursery-school children—C. B. KEY, M. R. WHITE, M. P. HONZIK, A. HEINEY, AND D. ERWIN
3. A study of the present social status of a group of adults, who, when they were in elementary schools, were classified as mentally deficient—W. R. BALLER
4. The influence of specific experience upon mental organizations—A. ANASTASI
- 5 & 6. Studies in aggressiveness—L. BENDER, S. KEISER, AND P. SCHILDER

VOLUME 19—January-December, 1937

1. Psychological bases of self-mutilation—C. DABROWSKI
2. Masculine temperament and secondary sex characteristics: A study of the relationship between psychological and physical measures of masculinity—H. GILKINSON
3. A psychological study of forty unmarried mothers—R. D. NOTTINGHAM
4. Behavior problems in the children of psychotic and criminal parents—L. BENDER
5. Domination and integration in the social behavior of young children in an experimental play situation—H. H. ANDERSON
6. The sequential patterning of prone progression in the human infant—L. B. AMES

VOLUME 20—January-December, 1938

1. The relationship between characteristics of personality and physique in adolescents—P. S. DE Q. CABOT
2. Behavior problems of elementary school children: A descriptive and comparative study—I. Y. MASTEN
3. Graphic representation of a man by four-year-old children in nine prescribed drawing situations—P. F. GRIDLEY
4. Differences between two groups of adult criminals—R. S. TOLMAN
5. A comparative study by means of the Rorschach method of personality development in twenty pairs of identical twins—E. TROUP
6. Individual differences in the facial expressive behavior of preschool children: A study by the time-sampling method—C. SWAN

VOLUME 21—January-December, 1939

1. An experimental analysis of "level of aspiration"—R. GOULD
2. Some light on the problem of bilingualism as found from a study of the progress in mastery of English among school children of non-American ancestry in Hawaii—M. E. SMITH
3. Domination and social integration in the behavior of kindergarten children and teachers—H. H. ANDERSON
4. The capacity of the rhesus and cebus monkey and the gibbon to acquire differential response to complex visual stimuli—W. E. GALT
5. The social-sex development of children—E. H. CAMPBELL

VOLUME 22—January-December, 1940

1. Measuring human relations: An introduction to the study of the interaction of individuals—E. D. CHAPPEL
2. Aggressive behavior in young children and children's attitudes toward aggression—M. D. FITE
3. Student attitudes toward religion—E. NELSON
4. The prediction of the outcome-on-furlough of dementia praecox patients—J. S. JACOB
5. Significant characteristics of preschool children as located in the Conrad inventory—K. H. READ
6. Learning by children at noon-meal in a nursery school: Ten "good" eaters and ten "poor" eaters—J. B. McCAY, E. WARRING, AND P. J. KRUSE
7. Studies in the interpretation of play: I. Clinical observation of play disruption in young children—E. H. ERIKSON

VOLUME 23—January-June, 1941

1. An analysis of certain variables in a developmental study of language—F. M. YOUNG
2. Infant development under conditions of restricted practice and of minimum social stimulation—W. DENNIS
3. An analysis of the mental factors of various age groups from nine to sixty—B. BALINSKY
4. Factors influencing performance on group and individual tests of intelligence: I. Rate of work—M. W. BENNETT
5. Individual differences in apperceptive reaction: A study of the response of preschool children to pictures—E. W. ANDERSON

VOLUME 24—July-December, 1941

1. Twins T and C from infancy to adolescence: A biogenetic study of individual differences by the method of control—A. GESSELL AND H. THOMPSON
2. Finger nail-biting: Its incipency, incidence, and amelioration—A. L. BILLIG
3. An experimental study of the factors of maturation and practice in the behavioral development of the embryo of frog, *Rana pipiens*—A. FROMME
4. The Fels child behavior scales—T. W. RICHARDS AND M. P. SIMONS
5. Measurement of the size of general English vocabulary through the elementary grades and high school—M. K. SMITH
6. Stereotypes in the field of musical eminence—P. R. FARNSWORTH

VOLUME 25—January-June, 1942

1. A study of factors determining family size in a selected professional group—J. C. FLANAGAN
2. A genetic study of geometrical-optical illusions—A. WALTERS
3. Interpretation of behavior-ratings in terms of favorable and unfavorable deviations: A study of scores from the Rorschach Behavior Inventory—K. H. READ AND H. S. CONRAD
4. Are there any innate behavior tendencies?—J. B. SCHOELLAND
5. An investigation of the intelligibility of the speech of the deaf—C. V. HUDGINS AND F. C. NUMBERS

Genetic Psychology Monographs (continued)

VOLUME 26—July-December, 1942

The critical frequency limen for visual flicker in children between the ages of 6 and 18—V. L. MILLER
Some factors determining handedness in the white rat—K. L. WENTWORTH
Motivation and behavior—E. FRENKEL-BRUNSWIK

VOLUME 27—January-June, 1943

Comparison of children's personality traits, attitudes, and intelligence with parental occupation—N. R. MADDY
A comparative study of mental functioning patterns of problem and non-problem children seven, eight, and nine years of age—M. L. PIGNATELLI

VOLUME 28—July-December, 1943

Separation anxiety in young children: A study of hospital cases—H. EDELSTON
Correlates of vocational preferences—W. A. BRADLEY, JR.

VOLUME 29—January-June, 1944

Mental changes after bilateral prefrontal lobotomy—S. D. PORTEUS AND R. D. KEPNER
A twin-controlled experiment on the learning of auxiliary languages—B. PRICE, W. J. KOSTIR, AND W. M. TAYLOR

VOLUME 30—July-December, 1944

A method of administering and evaluating the thematic appreciation test in group situations—R. M. CLARK
A study of anxiety reactions in young children by means of a projective technique—R. TEMPLE AND E. W. AMEN

VOLUME 31—January-June, 1945

The evolution of intelligent behavior in rhesus monkeys—B. WEINSTEIN
Perceptual behavior of brain-injured, mentally defective children: An experimental study by means of the Rorschach technique—H. WERNER

VOLUME 32—July-December, 1945

A clinical study of sentiments: I.—H. A. MURRAY AND C. D. MORGAN
A clinical study of sentiments: II.—H. A. MURRAY AND C. D. MORGAN

VOLUME 33—January-June, 1946

Interpretation of spontaneous drawings and paintings—T. S. WÄRNER
Preferences for sex symbols and their personality correlates—K. FRANCK
Outstanding traits: In a selected college group, with some reference to career interests and war records—F. L. WELLS AND W. L. WOODS

VOLUME 34—July-December, 1946

The relation of emotional adjustment to intellectual function—J. L. DESPERT AND H. O. PIERCE
The smiling response: A contribution to the ontogenesis of social relations—R. A. SPITZ
Finger-painting and personality diagnosis—P. J. NAPOLI

VOLUME 35—January-June, 1947

The thematic apperception technique in the study of culture-personality relations—W. E. HENRY
A continuation study of anxiety reactions in young children by means of a projective technique—M. DORKEY AND E. W. AMEN
A study of the vocational interest trends of secondary school and college women—A. M. CAWLEY

VOLUME 36—July-December, 1947

Maze test validation and psychosurgery—S. D. PORTEUS AND H. N. PETERS
The diagnostic implications of Rorschach's test in case studies of mental defectives—I. JOLLES

VOLUME 37—January-June, 1948

The radio day time serial: A symbolic analysis—W. L. WARNER AND W. E. HENRY
The relation of personality characteristics and response to verbal approval in a learning task—G. L. GRACE
The mechanism of vision: XVIII. Effects of destroying the visual "associative areas" of the monkey—K. S. LASHLEY
A study of the relationship between handwriting and personality variables—P. CASTELNUOVA-TEDESCO

VOLUME 38—July-December, 1948

Modern language learning: The intensive undergraduate course as sponsored by the United States Army, and implications for the conflict: A study of some interactions between appetite and aversion in the white rat—M. A. TOLCOTT
Schizophrenia and the MAPS test: A study of certain formal psycho-social aspects of fantasy production in schizophrenia as revealed by performance on the Make a Picture Story (MAPS) Test—E. S. SHNEIDMAN
A study of the transmission of authority patterns in the family—H. L. INGERSOLL

VOLUME 39—January-June, 1949

A study of the psychoanalytic theory of psychosexual development—G. S. BLUM
The assessment of parental attitudes in relation to child adjustment—E. J. SHOEN, JR.
Qualitative differences in the vocabulary responses of normals and abnormals—H. FEIFEL
The relative effectiveness of motion and still pictures as stimuli for eliciting fantasy stories about adolescent-parent relationships—P. E. EISERER

The organization of hereditary maze-brightness and maze-dullness—L. V. SEARLE

VOLUME 40—July-December, 1949

An experimental study of what young school children expect from their teachers—B. BIBER AND C. LEWIS
A study of the relative effects of age and of test difficulty upon factor patterns—H. A. CURTIS
A projective experiment using incomplete stories with multiple choice endings—J. K. SEATON
Effects of sex role and social status on the early adolescent personality—E. MILNER
Social perceptions and attitudes of children—M. RADKE, H. TRAGER, AND H. DAVIS

VOLUME 41—January-June, 1950

Some psychological and educational aspects of pediatric practice: A study of well-baby clinics—L. H. BLUM
One-trial learning in the domestic rat—B. B. HUDSON

An introduction to the principles of scientific psychoanalysis—A. ELLIS
Awareness of racial differences by preschool children in Hawaii—D. V. SPRINGER

Age trends in children's evaluation of teacher-approved and teacher-disapproved behavior—S. L. WITRYOL
The relationship between level of vocational aspiration and certain personal data: A study of some traits and influences bearing on the prestige level of vocational choice—J. STUBBINS

VOLUME 42—July-December, 1950

Personality patterns of suicidal mental hospital patients—N. L. FARREROW
Sex-role identification in young children in two diverse social groups—M. RABBAN
A study of the influence of the social field on individual behavior: As revealed in the expression of hostility and warmth by neurotics and paranoid schizophrenics in discussion group situations—D. SHAPIRO
An experimental study of avoidance—R. F. HEFFERLINE

VOLUME 43—January-June, 1951

A study of copying ability in children—E. A. TOWNSEND
Prestige motivation of gifted children—D. P. AUSUBEL
A psychological study of physical scientists—A. ROE

VOLUME 44—July-December, 1951

The organization of hostility controls in various personality structures—S. FISHER AND E. HINDS
Children and radio: A study of listeners and non-listeners to various types of radio programs in terms of selected ability, attitude, and behavior measures—E. A. RICCIUTI
Quantitative expression in young children—W. E. MARTIN
The use of magnetic devices in the collection and analysis of the preverbal utterances of an infant—A. W. LYNIP

VOLUME 45—January-June, 1952

A statistical study of the Freudian theory of levels of psychosexual development—C. A. BARNES
Personality characteristics of selected disability groups—D. N. WIENER

Genetic Psychology Monographs (continued)

VOLUME 46—July-December, 1952

1. The relationship of social status, intelligence, and sex of ten- and eleven-year-old children to an awareness of poverty—F. J. ESTVAN
An empirical study of the castration and Oedipus complexes—S. M. FRIEDMAN
2. The relationship between projective test scoring categories and activity preferences—M. M. SCHWARTZ
A comparison of formal and content factors in the diagnostic testing of schizophrenia—M. SHERMAN

VOLUME 47—January-June, 1953

1. Ability and accomplishment of persons earlier judged mentally deficient—D. C. CHARLES
Variations in the consistency of the behavioral meaning of personality test scores—M. KORNREICH
2. Some child-rearing antecedents of aggression and dependency in young children—R. R. SEARS, *et al.*
Symptom correlates for descriptive diagnosis—J. R. WITTENBORN, *et al.*

VOLUME 48—July-December, 1953

1. Age and mental abilities: A longitudinal study—W. A. OWENS, JR.
The development of a personality questionnaire for drinkers—P. J. HAMPTON
Personality and physical disease: A test of the Dunbar hypothesis applied to diabetes mellitus and rheumatic fever—D. H. CROWELL
2. Socio-economic contrasts in children's peer culture prestige values—B. POPE
A critical review of the stability of social acceptability scores obtained with the partial-rank-order and the pair comparison scales—S. A. WITRYOL AND G. G. THOMPSON
A study of the effects of color on Rorschach responses—G. G. BRODY

VOLUME 49—January-June, 1954

1. Factors underlying major reading disabilities at the college level—J. A. HOLMES
Parent behavior toward first and second children—J. K. LASKO
2. Social status and intelligence: An experimental study of certain cultural determinants of measured intelligence—E. A. HAGGARD
Certain determinants and correlates of authoritarianism—S. SIEGEL
Personalities in faces: I. An experiment in social perceiving—P. F. SECORD, W. F. DUKES, AND W. BEVAN

VOLUME 50—July-December, 1954

1. A study of the relationship between play patterns and anxiety in young children—E. W. AMEN AND N. RENISON
Operational exploration of the conceptual self system and of the interaction between frames of reference—M. EDELL AND A. E. JONES
Problem solving: A statistical description of some relationships between organismic factors and selected response measures—N. A. FATTU, E. KAPOV, AND E. V. MECH
2. The relation of cortical potentials to perceptual functions—C. CHYATTE
The import for clinical psychology of the use of tests derived from theories about infantile sexuality and adult character—D. W. MILES

Measuring personality in developmental terms: The Personal Preference Scale—M. H. KROUT AND J. K. TABIN

VOLUME 51—January-June, 1955

1. Some relations between techniques of feeding and training during infancy and certain behavior in childhood—BERNSTEIN
The expression of personality in drawings and paintings—L. H. STEWART
2. Negative stereotypes concerning Americans among American-born children receiving various types of minority-group education—J. A. FISHMAN
The Lincoln-Oseretsky Motor Development Scale—W. SLOAN

VOLUME 52—July-December, 1955

1. Some personality correlates of sex, sibling position, and sex of sibling among five- and six-year-old children—H. KOCH
A quantitative Rorschach assessment of maladjustment and rigidity in acculturating Japanese Americans—G. DeVOS
Measurement of authoritarianism and its relation to teachers' classroom behavior—H. M. MCGEE
2. The formal aspects of schizophrenic verbal communication—B. MIRIN
A study in an aspect of concept formation, with subnormal, average, and superior adolescents—H. N. HOFFMAN
Traumatic avoidance learning: Acquisition and extinction in dogs deprived of normal peripheral autonomic function—L. C. WYNNE AND R. L. SOLOMON

VOLUME 53—January-June, 1956

1. As the psychiatric aide sees his work and problems—F. L. WELLS, M. GREENBLATT, AND R. W. HYDE
An investigation of avoidance, anxiety, and escape behavior in human subjects as measured by action potentials muscle—J. D. BROTHERS
Spread of effect: A critical review—M. H. MARX
2. Stress, fantasy, and schizophrenia: A study of the adaptive processes—O. J. B. KERNER
The attitude structure of the individual: A Q-study of the educational attitudes of professors and laymen—F. N. KERLINGER

VOLUME 54—July-December, 1956

1. A study of personality differences between middle and lower class adolescents: The Szondi Test in culture-personality research—L. RAINWATER
The assessment of parental identification—S. W. GRAY AND R. KLAUS
2. The influence of social context on impulse and control tendencies in preadolescents—G. H. ZUK
Tender-mindedness versus tough-mindedness in psychology: A reexamination—H. WINTHOPE
A method for the comparison of groups: A study in thematic apperception—L. C. SCHAW AND W. E. HENRY

VOLUME 55—January-June, 1957

1. Academic performance and personality adjustments of highly intelligent college students—B. M. HORRALL
The use of the Vineland Social Maturity Scale in the planning of an educational program for non-institutionalized low-grade mentally deficient children—M. G. GOTTSCHEN
2. The structure and origin of the anal character—H. BELOFF
Free expression of adolescents' interests—M. AMATORA
The role of mass media and the effect of aggressive film content upon children's aggressive responses and identification choices—R. S. ALBERT
Interest in persons as an aspect of sex difference in the early years—E. W. GOODENOUGH

VOLUME 56—July-December, 1957

1. Some stable response determinants of perception, thinking, and learning: A study based on the analysis of a single subject—M. L. SIMMEL AND S. COUNTS
Potentials of age: An exploratory field study—S. L. PRESSEY
2. Tactile communication—L. K. FRANK
The use of a filmed puppet show as a group projective technique for children—M. R. HAWORTH
The social competence of middle-aged people—R. J. HAVIGHURST

VOLUME 57—January-June, 1958

1. Psychological and cultural problems in mental subnormality: A review of research—S. B. SARASON AND T. GLAD
Developmental aspects of discrimination in relation to adjustment—P. LONDON
Muscular tension as a response to psychological stress in rheumatoid arthritis and peptic ulcer—J. A. SOUTHWELL
2. Frustration: Theory and experiment—R. LAWSON AND M. H. MARX

VOLUME 58—July-December, 1958

1. Emotional aspects of political behavior: The woman voter—E. M. BENNETT AND H. M. GOODWIN
The accuracy of self estimate: A measure of self-concept reality—R. M. BRANDT
Personality factors in social mobility: A study of occupationally mobile businessmen—J. C. ABEGGLEN
2. Interaction between authoritarian and nonauthoritarian principals and teachers—P. LAMBERT
Some factors related to the choice-status of ninety eighth-grade children in a school society—D. ELKINS
Some factors related to the choice-status of ninety eighth-grade children in a school society—D. ELKINS

VOLUME 59—January-June, 1959

- Freshman Rorschachs and college performance—G. R. SCHMEIDLER, M. J. NELSON, AND M. BRISTOL
 Perceptual aspects of attributed movement—R. W. COAN
 Men and women: Personality patterns and contrasts—E. M. BENNETT AND L. R. COHEN
 Personality factors in mothers of cerebral palsied children—G. BOLES
 Separatism and integrationism: A social-psychological analysis of editorial content in New York newspapers of three
 American minority groups—J. A. FISHMAN AND G. S. FISHMAN
 Self, role, and satisfaction—A. L. BROPHY

VOLUME 60—July-December, 1959

- The constancy of personality ratings over two decades—R. D. TUDDENHAM
 Mother-son identification and vocational interest—L. H. STEWART
 A study of mother-child relationships in the emotional disorders of children—M. J. ROSENTHAL, M. FINKELSTEIN, E.
 NI, AND R. E. ROBERTSON
 On the trail of the wolf-children—W. F. OGBURN AND N. K. BOSE
 Predicting the mental health of normal adults—R. F. PECK
 Parental identification in young children—W. EMMERICH
 The problems of Jewish religious youth—B. M. LEVINSON

VOLUME 61—January-June, 1960

- Identifying socially maladjusted school children—A. A. ADAMS
 Social interaction in an interracial nursery school—H. W. STEVENSON AND N. G. STEVENSON, *et al.*
 Interests of pre-adolescent boys and girls—M. AMATORA
 Educational and sex differences in the organization of abilities in technical and academic students in Colombia, South
 America—J. F. FILELLA
 Some themes in the personalities of German men—L. RAINWATER
 Right-left gradients in body image, body reactivity, and perception—S. FISHER
 Longitudinal survey of child Rorschach responses: Younger subjects two to 10 years—L. B. AMES
 Personality patterns related to occupational roles—M. SIEGELMAN AND R. F. PECK

VOLUME 62—July-December, 1960

- The reading process: A descriptive, interdisciplinary approach—M. P. LANGMAN
 Reactions to stress as a function of the level of intelligence—S. M. H. ZAIDI
 Rorschach diagnosis by a systematic combining of content, thought process, and determinant scales—P. A. BOWER,
 R. TESTIN, AND A. ROBERTS
 Longitudinal survey of child Rorschach responses: Older subjects aged 10 to 16 years—L. B. AMES
 Twenty years of shock therapy in America, 1937-1956: An annotated bibliography—N. H. PRONKO, R. SITTERLY, AND
 K. BERG
 The quantitative analysis of parent behavior toward psychotic children and their siblings—E. M. DONNELLY

VOLUME 63—January-June, 1961

- Make a sentence test: An approach to objective scoring of sentence completions—E. F. BORGATTA
 Some aspects of the relationship between perception and motility in children—E. P. ROTHMAN
 Some psychophysical aspects of mental illness in children—P. H. BERKOWITZ
 Conceptual thinking in schizophrenic children—G. FRIEDMAN
 Some maternal influences on children's personality and character—J. C. FINNEY
 A study of concept formation in normals, mental defectives, and brain-damaged adults—R. W. ZASLOW
 An investigation of trait relationships among six-year-old children—S. A. AVAKIAN

VOLUME 64—July-December, 1961

- Coping patterns of preschool children in response to intelligence test demands—A. MORIARTY
 Studies of individual and paired interactional problem-solving behavior of rats: II. Solitary and social controls—
 A. BARON AND R. A. LITTMAN
 Studies of role performance—J. H. MANN
 A psychological assessment of professional actors and related professions—R. TAFT
 A cross-cultural study of menstrual taboos—W. N. STEPHENS
 The biological roots of creativity—H. GUTMAN

VOLUME 65—January-June, 1962

- A Rorschach study of the development of personality structure in white and Negro children in a Southeastern
 community—A. C. PRICE
 Measuring personality patterns of women—J. LOEVINGER
 Home interests in early adolescence—M. AMATORA
 Social and emotional adjustment during adolescence as related to the development of psychosomatic illness in
 adulthood—L. H. STEWART
 A systematic study of interaction process scores, peer and self-assessments, personality and other variables—E. F.
 BORGATTA
 Children's conceptions of the content and functions of the human body—E. GELLERT

VOLUME 66—July-December, 1962

- Ocular-manual laterality and perceptual rotation of literal symbols—I. FLESCHER
 Parental child-rearing attitudes and their correlates in adolescent hostility—S. B. CHOROST
 Some explorations into the nature of anxieties relating to illness—P. R. ROBBINS
 Developmental-interactive aspects of hypnosis: Some illustrative cases—J. R. HILGARD AND E. R. HILGARD
 Teaching a two-year-old to read: An experiment in early childhood learning—W. FOWLER
 Achievement gains or losses during the academic year and over the summer vacation period: A study of trends in
 achievement by sex and grade level among students of average intelligence—K. M. PARSLEY, JR., AND M. POWELL

VOLUME 67—January-June, 1963

- Verbatim dialogue of a mother and child in therapy—C. E. MOUSTAKAS
 A study of self-concept: Delinquent boys' accuracy in selected self-evaluations—W. E. AMOS
 An integrating study of the factor structure of adult attitude interests—R. B. CATTELL AND J. HORN
 Social factors in mental disorders: A contribution to the etiology of mental illness—W. G. COBLINER
 Conceptual preferences associated with choice of quantitative and nonquantitative college majors—J. GILBERT
 A study of the concept of the feminine role of 51 middle-class American families—A. STEINMANN

VOLUME 68—July-December, 1963

- Brain dynamism as reflected in illusions—G. K. YACORZYNSKI
 The nature and measurement of components of motivation—R. B. CATTELL, J. A. RADCLIFFE, AND A. B. SWENEY
 Sharing in preschool children as a function of amount and type of reinforcement—W. F. FISCHER
 The Gesell Incomplete Man Test as a measure of developmental status—L. B. AMES AND F. L. ILG
 Psychological and sociological factors in prediction of career patterns of women—M. C. MULVEY
 Functionalism and its historical significance—R. HARRISON

PUBLICATION IN THE JOURNAL OF PSYCHOLOGY

The Journal of Psychology provides a special service to authors and readers. Articles accepted for publication appear in print with the least possible delay. Although editorial standards are the same as those for the other journals, all correspondence and handling are expedited, and the referees may, at their discretion, permit some latitude in length of treatment with respect to tabular material, discussion, and review of the literature.

To save time, authors are requested to exercise unusual care in preparing their papers. Special attention should be paid to the General Instructions on the back cover of each issue and to the announcement on the first preliminary page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

September, 1974
Volume 88, First Half

(Founded in 1935 by Carl Murchison)

The Journal of PSYCHOLOGY

The General Field of Psychology

If this space should be unstamped, this is the regular library edition. But if this space is stamped with a designating title, this is a special edition, sold under the

restrictions of a bilateral contract, and may not be resold for a period of five years from the date of publication.

SEPTEMBER, 1974

(Manuscripts are printed in the order of final acceptance)

- Sex differences in incidental learning and recall of related and unrelated word pairs 3
BY MICHAEL L. EPSTEIN
- Communication bias in black-white groups 9
BY DAVID L. PATTERSON AND STANLEY J. SMITS
- Body-cathexis and self-esteem: The importance of subjective importance 27
BY E. R. MAHONEY
- Unwillingness to communicate, anomia-alienation, and communication apprehension as predictors of small group communication 31
BY JUDEE K. BURGOON AND MICHAEL BURGOON
- A 15-item form of the F Scale and a cross-cultural application 39
BY HARRISON G. GOUGH AND RENATO LAZZARI

(OVER)

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts

A theoretical explanation for the intermediate level of tension found in non-balanced <i>P-O-X</i> triads	47
By AROLD RODRIGUES AND CILIO R. ZIVIANI	
Entrepreneurial activity as a function of achievement motivation and reinforcement control	57
By DOUGLAS DURAND AND DENNIS SHEA	
The hierarchical factor structure of the WISC and revised ITPA for reading disabled children	65
By FRED H. WALLBROWN, JOHN BLAHA, DOROTHA H. COUNTS, AND JANE D. WALLBROWN	
Purposes and procedures of validation	77
By M. Y. QUERESHI	
Locus of control, study habits and attitudes, and college academic performance	91
By TERRY J. PROCIUK AND LAWRENCE J. BREEN	
Personality correlates of anagram problem solving	97
By EDWARD I. GAVURIN AND DOROTHY MURGATROYD	
Personality, the sociocultural environment, and student political activism: Toward a field theory of social behavior	103
By STEPHEN I. ABRAMOWITZ	
Absolute and relative bidirectional transfer in verbal conflict resolution tasks	113
By JOHN M. BRAME AND KENNETH A. BLICK	
An analysis of supplementary subtests and their influence on total WISC scores of high achieving students	121
By ANN W. ENGIN	
Response to stimulus uncertainty in four-, six-, and eight-year-old children	127
By RICHARD B. MAY AND CORINNE HUTT	
Influence through personal and nonpersonal channels of communication	135
By CHARLES D. WARD, BARBARA L. SEBODA, AND VERNON B. MORRIS, JR.	
Two methods of psychiatric interviewing: Telephone and face-to-face	141
By ROBERT J. SIMON, JOSEPH L. FLEISS, BERNICE FISHER, AND BARRY J. GURLAND	
Cognitive appraisal: An examination	147
By RICHARD I. FISHER	
SES differences in effects of brief social satiation	153
By ELISHA Y. BABAD	

SEX DIFFERENCES IN INCIDENTAL LEARNING AND RECALL OF RELATED AND UNRELATED WORD PAIRS*¹

Rider College

MICHAEL L. EPSTEIN

SUMMARY

A $2 \times 2 \times 2 \times 2$ factorial design was used to examine the effects of sex differences, grade, and processing levels in incidental learning and recall of paired associates. Male and female college and high school students processed 30 related and 30 unrelated word pairs by finding similarities or differences between paired items. Males showed better retention than females on a cued recall test, but only at the high school level. Recall of subjects at each grade level was significantly influenced by both pair relationship and processing task. Although recall differences due to sex were thought to be caused by self-selection of subjects at the high school level, the pair relationship \times processing task interaction was explained within the framework of a "continuum" model of memory.

A. INTRODUCTION

While there has been extensive research on sex differences in a number of areas—creativity, aggressiveness, attitudes, intelligence, etc.—there has been scant interest over the last 25 years in the question of sex differences in information processing and recall. A review of the literature over the last quarter century reveals only a handful of studies concerned with sex differences in this area.

Duggan (4) tested school children between the ages of 14 and 16 for word and number memory. She found that males correctly recalled more numbers than females on a free-recall test, but that females recalled more words than males. Similar findings showing superior word recall for females was reported by King (7). Twenty-nine groups of male and female subjects were compared on immediate and delayed recall of passages varying in approximations to

* Received in the Editorial Office on May 30, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The author thanks Dr. Helen Olive for her critical comments on an early draft of this paper and, also, the administration of Jackson Memorial High School for their cooperation.

normal English. In 21 out of 29 of the groups, females demonstrated better recall than males. There were no sex differences for the amount of material forgotten between immediate and delayed recall. Cofer, Diamond, Olsen, Stein, and Walker (2) found that females learned paired associates under the recall method significantly faster than males, but they attributed the difference to random sampling error.

In one of the few studies that examined sex differences in both information processing and recall, Meinke (8) had subjects either intentionally learn a list of stimulus words or attempt to find as many synonyms as possible for each word in a two-minute period. This latter task was expected to result in incidental learning of the stimulus words. Intentional learners were more efficient on recall of the words than incidental learners, with females recalling significantly more words than males following incidental learning, but there were no sex differences for the number of synonyms generated on the incidental learning task. Meinke suggests that females recalled more words than males because they may have anticipated the recall test while males did not.

Since there is no *a priori* evidence to suggest that females are more likely than males to anticipate a surprise recall test, a further investigation of sex differences in recall is in order. The present experiment investigated sex differences in the cued recall of paired associates following incidental learning. The incidental orienting task was designed to vary the level or depth of processing of the stimulus material.

B. METHOD

Seventy-two (36 male, 36 female) introductory psychology students at Rider College and 42 (21 male, and 21 female) high school seniors at Jackson Memorial High School in Jackson, New Jersey, served as subjects. Subjects were shown 60 pairs of concrete nouns, one half of which consisted of unrelated items (e. g., axle-hat). Each pair of items was projected upon a movie screen once for a 15-second interval. During this interval subjects were instructed to find and record a semantic similarity between paired items for one half the pairs and a semantic difference between items for the other half. Hence, four cells were formed with 15 word pairs per cell. All 60 word pairs were shown in a single session with subjects performing their task to each word pair as it was shown. Subjects were not instructed to try to learn the word pairs.

Following presentation of the entire list of paired associates, the sheet of paper on which the subject had recorded the similarities and differences was removed. Subjects were then instructed to attempt recall of the second mem-

ber of each word pair when shown the first. The presentation order at recall was different from that during processing. Each cue word was shown for eight seconds during which time the subject had to recall and write its paired associate.

C. RESULTS

The data were analyzed in a $2 \times 2 \times 2 \times 2$ factorial analysis of variance. The two between-subject factors represented grade level (college *versus* high school) and sex (male *versus* female). The within-subjects factors represented the relationship of the words in the paired associates (related *versus* unrelated) and the processing task (find a similarity *versus* find a difference).

Inspection of Table 1 reveals that males recalled significantly more response

TABLE 1
MEAN NUMBER OF CORRECTLY RECALLED WORDS (OUT OF 15) FOR EACH
TREATMENT CONDITION

Grade level	Related-similarity	Pair-processing relationship		Unrelated-difference
		Related-difference	Unrelated-similarity	
High school				
Males	13.38	14.00	8.62	6.24
Females	11.86	12.81	5.48	3.62
College				
Males	12.36	13.53	5.67	4.19
Females	12.58	13.03	6.17	4.25

items than females ($F_{1,110} = 9.32$, $p < .005$). However, college females showed slightly higher recall than college males, indicating that the overall recall difference in favor of males was due to better recall for high school males relative to high school females. This interdependence of grade level and sex is shown by the significant grade \times sex interaction ($F_{1,110} = 13.26$; $p < .001$).

Recall, not surprisingly, was significantly influenced by pair relationship. Related pairs were recalled much better than unrelated pairs, regardless of whether subjects found similarities or differences between the paired words ($F_{1,110} = 1434.20$; $p < .001$). In addition, related pairs for which subjects found a difference were recalled better than related pairs for which they found a similarity. Conversely, unrelated pairs for which subjects found a similarity were recalled better than unrelated pairs for which they found a difference. Thus, the processing task did not affect recall independently of the relationship of the paired words. This is shown by the significant pair \times process interaction ($F_{1,110} = 65.04$; $p < .001$).

D. DISCUSSION

It was assumed that finding a similarity between unrelated items or finding a difference between related items required a deeper or more thorough analysis of the semantic features of the paired words than that required in finding a similarity between related items or a difference between unrelated items.

The higher recall observed for the more deeply processed pairs in the present study supports Craik and Lockhart's (3) single-continuum hypothesis of memory. According to this hypothesis, memory is a by-product of perceptual analyses, a continuum ranging from the transitory products of a cursory analysis of physical features to longer lasting memory traces resulting from deeper semantic analyses. Retention, then, is regarded as a positive function of the depth of processing or level of analysis of the stimulus material.

Several recent studies (5, 6, 9) in which subjects engaged in learning tasks designed to vary the level of processing have supported the continuum hypothesis. In all of the above studies subjects were tested for recall following an incidental learning task on which they were oriented toward semantic features of the stimulus words. Recall was found to be equal to or greater than recall for the same items following intentional learning instructions. The present data suggest that varying the degree to which processing demands are made upon the subjects by the semantic task results in differing levels of recall. That is, even though all paired associates in the present study were processed semantically, recall was better for those pairs requiring a more complete analysis of their semantic features.

A recent study by Amster and Wiegand (1) demonstrated that seven- and 10-year-old females excelled in free recall of words relative to males at the same age level following an incidental learning task on which they were instructed to categorize items in a word list. The authors suggested that better recall for the females was a function of cognitive differences—females excel in abstract verbal abilities; males excel in visual-spatial ones.

Although the previously cited studies have shown that females are superior to males in the free recall of words, the present study suggests the opposite conclusion. Males showed higher word recall than females following an incidental semantic orienting task. In fairness, it should be stated that several of the earlier studies did not attribute the observed female recall superiority to a "real" sex difference, but to random sampling error or other artifacts. The learning task in the present study required subjects to find similarities and differences between word pairs made up of concrete nouns. The ability

to visualize the objects denoted in the paired associates by using visual imagery would facilitate subjects' carrying out the task instructions, especially in the more difficult instances (i.e., finding similarities between unrelated items and differences between related items). To the extent that recall was improved by completion of the orienting task, males enjoyed an advantage because of superior visual-spatial abilities.

However, since the finding of superior male recall in the present study was restricted to high school subjects, a closer examination of the high school population is warranted. Jackson Memorial High School is located in Jackson Township, New Jersey, much of which is a rural farming community. A little more than one-half of the graduating seniors go on for advanced schooling—25% go to four-year colleges and 30% go into two-year programs. A substantial number of students terminate their schooling prior to graduation from high school in order to work, many on local farms. More males than females withdraw from school before graduation, resulting in self-selection among the male senior students. Thus, it is likely that there would be a higher percentage of academically oriented, intellectually motivated males than females in the senior class, regardless of the composition of the student body in general. It is not surprising, then, that these males would perform well in an information processing and recall experiment.

The overall superior recall for males in the present study is, therefore, suspect. There was not a significant difference in recall due to sex at the college level; the only difference observed was at the high school level with males recalling significantly more responses than females. One is forced to conclude that the observed sex differences in recall in the present study, although in the opposite direction from earlier studies is, as before, an artifact.

REFERENCES

1. AMSTER, H., & WIEGAND, V. Developmental study of sex differences in free recall. *Proc. 80th Ann. Conven. Amer. Psychol. Assoc.*, 1972, 7, 75-76.
2. COFER, C. N., DIAMOND, F., OLSEN, R. A., STEIN, J. S., & WALKER, H. Comparison of anticipation and recall methods in paired-associate learning. *J. Exper. Psychol.*, 1967, 75, 545-558.
3. CRAIK, F. I. M., & LOCKHART, R. S. Level of processing: A framework for memory research. *J. Verb. Learn. & Verb. Behav.*, 1972, 11, 671-684.
4. DUGGAN, L. An experiment on immediate recall in secondary school children. *Brit. J. Psychol.*, 1950, 40, 149-154.
5. EPSTEIN, M. L., & WARD, T. B. Recall of related and unrelated word pairs: Test of single-continuum theory of memory. *Percept. & Motor Skills*, in press.
6. HYDE, T. S., & JENKINS, J. J. Recall for words as a function of semantic, graphic, and syntactic orienting tasks. *J. Verb. Learn. & Verb. Behav.*, 1973, 12, 471-480.
7. KING, D. J. Sex differences in learning and forgetting of partly connected meaningful material. *Psychol. Rep.*, 1959, 5, 504.

8. MEINKE, D. L. Stimulus properties, sex of subjects, and their effects upon incidental and intentional learning. *Proc. 77th Ann. Conven. Amer. Psychol. Assoc.*, 1969, 4, 79-80.
9. TREISMAN, A., & TUXWORTH, J., Immediate and delayed recall of sentences after perceptual processing at different levels. *J. Verb. Learn. & Verb. Behav.*, 1974, 13, 38-44.

Department of Psychology
Rider College
Trenton, New Jersey 08602

COMMUNICATION BIAS IN BLACK-WHITE GROUPS*¹

Georgia State University

DAVID L. PATTERSON AND STANLEY J. SMITS

SUMMARY

The study defined prejudice as a statistically significant bias in the direction of verbal statements in T-groups whose membership was balanced by race and sex. Three major hypotheses were tested, and the results were discussed in relationship to the nature of prejudice and communication dynamics. Two T-group methodologies were contrasted as an exploration of potential intervention strategies. The results indicated that both race and sex contributed to significant biases, although race seemed to be the more substantive contributor.

A. INTRODUCTION

Communication is an interpersonal phenomenon based upon the dynamics of interpersonal attraction and the behaviors employed. Interpersonal attraction is related to contact, frequency of interaction, perceived similarity, reciprocal rewards, liking, and certain personality characteristics (7, 15). The disruptive impact of prejudice upon the communication process is simply that prejudiced people are seldom attracted to members of the group about which they hold the prejudice to the point that they actually depend upon one another enough to achieve a perceived similarity about important issues. Prejudice, with its disdain for information and its fear of entering into the interdependent process of communication, produces a faulty base for testing the reality of one's perceptions, causes distortion, and leads to aversion. The failure to communicate, in turn, decreases perceived similarity and increases the perceptual threat level, thereby reducing future chances for attraction. A vicious cycle results which requires the intervention of an outside force in order to break its internal reinforcement pattern.

* Received in the Editorial Office on June 5, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Reprints are available from the authors at the address shown at the end of this article.

The present study was designed to measure the amount of prejudice occurring in T-groups whose membership was balanced by race and sex, and to explore the efficacy of two T-group models as potential intervention strategies to reduce racial prejudice. Prejudice was operationally defined as a statistically significant bias in the direction of verbal statements.

B. METHOD

1. Subjects

The subjects were volunteers from two graduate classes in Counseling and Psychological Services at Georgia State University during the 1972-73 and 1973-74 academic years. Each group consisted of two black females, two white females, two black males, and two white males. Ss were randomly selected from among the volunteers in order to fill each category. Randomization was almost nonexistent among the black Ss because of the small number of volunteers: i.e., four out of seven in 1972 and four out of five in 1973. All but one of the Ss had had at least one previous experience in a counseling group. Ten of the 16 Ss had prior, or concurrent, work experience as counselors. Black male #1 (BM₁) in the 1972 group was confined to a wheelchair because of a spinal cord injury.

2. Treatments

Both groups were exposed to sensitizing experiences prior to the solicitation of volunteers. The members participated in a series of stereotyping exercises conducted in their graduate course as part of a unit on prejudice. Included among these exercises was an experience during which blacks stereotyped whites and *vice versa*. The 1973 Ss were exposed to an additional sensitizing experience in that the class was shown 50 minutes of video taped highlights from the 1972 group.

Both groups were solicited as volunteers for a "Black-White Communication Group." They were told that observers would be present to record behavioral data and that the sessions would be recorded on video and/or audio tape for research and training purposes. The groups were conducted by white male leaders who refrained from becoming active participants in the groups in order to preserve the male-female, black-white balance. Both groups were structured by the leaders regarding the objective of open, honest communication and given the usual prohibition against physical violence as an acceptable behavior.

The 1972 group was led by a white male with a doctoral degree who had other professional responsibilities for each of the members of the group, as

well as knowledge about them as individuals. The leader described his role as that of a stimulus and resource person. He provided continuous feedback on the behaviors of the group by commenting on the processes and dynamics he observed. The group was given the freedom and the responsibility to choose and develop its topics. The group met for five consecutive weekly sessions varying from 2-2½ hours in length. A sixth session was conducted to provide feedback from the observers and to debrief the Ss.

By contrast, the 1973 group was led by a white male doctoral student who had had no previous contact with, or knowledge of, the members of the group. The leader limited his role to giving behavioral feedback and to enforcing group rules. The group was told that only "here and now" themes were acceptable. This rule eliminated historical and extragroup topics. It was intended to focus the attention of the members on what was occurring, or had occurred, within the group. The group met for eight sessions, twice a week, for 1¼ hours each. A ninth session was employed for feedback and debriefing.

3. *Data Collection*

Data were collected by means of mechanical recording devices and behavioral observers. The 1972 group was observed by a black female, a black male, and four white females. Five observers worked at one time, with the extra one available for any needed substitution. One observer was present within the group room, while the others were located in two booths separated from the Ss by one-way mirrors. The fourth session was recorded on video tape with the camera and cameraman present within the room. The other sessions were recorded on audio tape with only the microphones exposed in the room.

The 1973 group met in a large seminar room and was observed by three white males and two white females all located in the room seated at tables placed in a "U" around the group. All sessions were video taped with an exposed camera and a white male cameraman present within the room.

The observers were given a brief orientation and practice session prior to the first group session. Each observer was responsible for one black S and one white S. The observers recorded the name of the recipient of each verbal statement made by one of the two Ss under their observation on a form designed for this study. A verbal statement was defined as any uninterrupted utterance. A single word, a phrase, a sentence, or a protracted statement were each recorded as one verbal statement.

4. *Analyses*

The data recorded by the observers were summed session by session. The number of verbal statements directed to members of each S's racial ingroup

and outgroup were tabulated, and percentages were calculated. The same procedure was followed for sex. These observed percentages were used to compare the response patterns of black *vs.* white and male *vs.* female Ss. Later they were used to contrast the observed *vs.* expected percentages. With eight members in each group, the ingroup members of any S were expected to receive $\frac{3}{4}$ of his verbal statements, while the outgroup members were expected to receive $\frac{1}{4}$ of his statements. Thus a black S was expected to direct 42.9% of his statements to the other three black Ss and 57.1% to the four white Ss. The sign test (18) was used to test the differences between pairs of Ss matched on the basis of race and sex. The sign test was also used to test the consistency of any deviation from the expected ingroup-outgroup statement ratio across sessions. The sign test is appropriate for two related samples. The only assumption for its use is that the variable under consideration must have a continuous distribution.

An analysis of the content was obtained by the writers by reviewing the audio and video tapes. For the purposes of this study, no attempt was made to present this analysis in quantitative terms.

Two-tailed sign tests applied to the quantitative analyses of the observers' recordings were used to test the following null hypotheses:

H₁: Black *vs.* white Ss do not differ significantly in the percentage of statements directed to their respective racial ingroups.

H₂: Male *vs.* female Ss do not differ significantly in the percentage of statements directed to their respective sex ingroups.

H₃: The direction of differences from the expected percentage of ingroup-outgroup statements is not consistent across sessions for Ss grouped according to race and sex.

C. RESULTS

1. Quantitative

The overall distribution of verbal statements made by the Ss in both groups is shown in Table 1. The 1972 Ss directed more statements to the group as a whole (14.8% *vs.* 7.3%) and fewer to the leader (13.0% *vs.* 18.1%). However, Ss in both groups directed a similar proportion of statements to one another. Individual members varied considerably, with each group having both highly verbal and relatively quiet members. The statements that the Ss directed to one another are the data used to test the hypotheses.

Table 2 shows the influence of the race of the Ss on the direction of verbal statements. Race accounted for a significant communication bias ($p = .008$).

TABLE 1
DISTRIBUTION OF VERBAL STATEMENTS

Subjects ^a	Group		Leader		Subjects		Total No.
	No.	%	No.	%	No.	%	
I. 1972							
BF ₁	34	25.6	19	14.4	79	59.8	132
BF ₂	53	11.9	86	19.3	306	68.8	445
WF ₁	16	11.8	12	8.8	108	79.4	136
WF ₂	29	16.9	6	3.5	136	79.5	171
BM ₁	57	12.3	70	15.1	336	72.6	463
BM ₂	38	28.8	8	6.1	86	65.1	132
WM ₁	13	9.6	11	8.1	112	82.3	136
WM ₂	18	13.6	15	11.4	99	75.0	132
Subtotal	258	14.8	227	13.0	1262	72.2	1747
II. 1973							
BF ₁	3	2.4	24	19.7	95	77.9	122
BF ₂	25	7.1	58	16.4	271	76.5	354
WF ₁	2	0.7	55	19.2	229	80.1	286
WF ₂	25	10.2	56	22.8	165	67.0	246
BM ₁	43	25.9	32	19.3	91	54.8	166
BM ₂	15	3.5	60	14.1	349	82.3	424
WM ₁	18	9.5	40	21.2	131	69.3	189
WM ₂	12	7.1	30	17.9	126	75.0	168
Subtotal	143	7.3	355	18.1	1457	74.6	1955

^a B = black, W = white, F = female, M = male.

In each matched pair of same-sex, different-race Ss, the black S directed more verbal statements to other blacks than the white Ss directed to other whites. The null hypothesis stating no difference between black and white Ss in terms of ingroup-outgroup communication patterns is therefore rejected. The results shown in Table 3 provide a similar analysis evaluating the influence of sex. The results indicate that matched pairs of same-race, different-sex Ss had no significantly consistent pattern of ingroup-outgroup communication. The second null hypothesis stating no difference between male and female Ss in terms of the amount of communication directed to their respective sex-ingroups is therefore accepted.

To summarize briefly at this point, a comparison of matched pairs of Ss within treatment groups shows a significant communication bias attributed to race but none attributed to sex.

The efficacy of the treatment in contrast to the durability of any prejudices existing within the treatment groups is tested, in part, by the third null hypothesis. Nonprejudiced communication patterns should approximate the

TABLE 2
INFLUENCE OF RACE ON THE DIRECTION OF VERBAL STATEMENTS

Matched pairs ^a	Statements directed to racial ingroup (%)			Sign
1972 Ss				
BF ₁ and WF ₁	63.3	vs.	13.0	+
BF ₂ and WF ₂	52.0	vs.	18.5	+
BM ₁ and WM ₁	46.1	vs.	12.5	+
BM ₂ and WM ₂	66.3	vs.	20.2	+
1973 Ss				
BF ₁ and WF ₁	71.6	vs.	23.6	+
BF ₂ and WF ₂	42.8	vs.	12.1	+
BM ₁ and WM ₁	59.3	vs.	21.4	+
BM ₂ and WM ₂	30.9	vs.	26.2	+

Note: Two-tailed sign test: $p = .008$.

^a B = black, W = white, F = female, M = male.

expected ingroup (42.9%) and outgroup (57.1%) verbal statement ratio. Consistent directional difference from the expected percentages across sessions is evidence of the durability of the prejudice and/or the lack of potency of the treatment. The converse is true for any lack of consistency in directional deviations from the expected percentages across sessions. The results of this analysis for the influence of race across sessions are shown in Table 4. A consistent communication bias favoring the outgroup is found for the 1972 white Ss ($p = .063$) and for the 1973 white Ss ($p = .070$). Even though the black Ss generally favored communication directed toward themselves, they deviated from that pattern for one session in the 1972 group and two

TABLE 3
INFLUENCE OF SEX ON THE DIRECTION OF VERBAL STATEMENTS

Matched pairs ^a	Statements directed to sex ingroup (%)			Sign
1972 Ss				
BF ₁ and BM ₁	45.6	vs.	41.1	+
BF ₂ and BM ₂	31.4	vs.	36.0	-
WF ₁ and WM ₁	50.0	vs.	35.7	+
WF ₂ and WM ₂	46.3	vs.	52.5	-
1973 Ss				
BF ₁ and BM ₁	27.4	vs.	23.7	+
BF ₂ and BM ₂	29.9	vs.	31.4	-
WF ₁ and WM ₁	27.1	vs.	40.5	-
WF ₂ and WM ₂	45.4	vs.	50.0	-

Note: Two-tailed sign test: $p = .726$.

^a B = black, W = white, F = female, M = male.

TABLE 4
DIRECTION OF VERBAL STATEMENTS: SESSIONS \times RACE

DIRECTION OF VERBAL STATEMENTS: SESSIONS X RACE				Sign
Session	Statements directed to racial ingroup (%)			
I. 1972 black Ss vs. expected (two-tailed sign test: $p = .276$)				
1	45.8	vs.	42.9	+
2	53.4	vs.	42.9	+
3	38.2	vs.	42.9	-
4	57.5	vs.	42.9	+
5	58.3	vs.	42.9	+
II. 1972 white Ss vs. expected (two-tailed sign test: $p = .063$)				
1	28.3	vs.	42.9	-
2	4.5	vs.	42.9	-
3	14.4	vs.	42.9	-
4	21.0	vs.	42.9	-
5	36.4	vs.	42.9	-
III. 1973 black Ss vs. expected (two-tailed sign test: $p = .290$)				
1	55.4	vs.	42.9	+
2	48.4	vs.	42.9	+
3	43.8	vs.	42.9	+
4	48.6	vs.	42.9	+
5	29.3	vs.	42.9	-
6	22.8	vs.	42.9	-
7	43.6	vs.	42.9	+
8	49.2	vs.	42.9	+
IV. 1973 white Ss vs. expected (two-tailed sign test: $p = .070$)				
1	22.4	vs.	42.9	-
2	9.3	vs.	42.9	-
3	11.7	vs.	42.9	-
4	6.7	vs.	42.9	-
5	6.0	vs.	42.9	-
6	16.1	vs.	42.9	-
7	45.1	vs.	42.9	+
8	39.8	vs.	42.9	-

sessions in the 1973 group. These results indicate either that black prejudice is less durable than white prejudice or that the treatment is more potent with black Ss, or some combination of the two. Although the whites in both groups are technically prejudiced when one applies an operational definition of prejudice as a significant communication bias, they are outwardly directed rather than isolating themselves from communication with the black Ss.

A similar analysis showing the results of the influence of sex across sessions is shown in Table 5. The 1973 female Ss are the only Ss exhibiting a sex bias in their communication. They were outgroup-oriented in the direction of their verbal statements for seven of the eight sessions. Null hypothesis 3 is therefore rejected for the 1973 female Ss as well as for the 1972 and 1973 white Ss.

TABLE 5
DIRECTION OF VERBAL STATEMENTS: SESSIONS \times SEX

Session	Statements directed to sex ingroup (%)		Sign
I. 1972 female Ss vs. expected (two-tailed sign test: $p = .999$)			
1	50.4	vs. 42.9	+
2	23.8	vs. 42.9	-
3	59.3	vs. 42.9	+
4	43.7	vs. 42.9	+
5	26.3	vs. 42.9	-
II. 1972 male Ss vs. expected (two-tailed sign test: $p = .999$)			
1	58.0	vs. 42.9	+
2	33.3	vs. 42.9	-
3	37.4	vs. 42.9	-
4	47.1	vs. 42.9	+
5	36.8	vs. 42.9	-
III. 1973 female Ss vs. expected (two-tailed sign test: $p = .070$)			
1	26.3	vs. 42.9	-
2	37.7	vs. 42.9	-
3	41.7	vs. 42.9	-
4	34.6	vs. 42.9	-
5	9.1	vs. 42.9	-
6	64.9	vs. 42.9	-
7	8.6	vs. 42.9	+
8	20.6	vs. 42.9	-
IV. 1973 male Ss vs. expected (two-tailed sign test: $p = .290$)			
1	31.1	vs. 42.9	-
2	53.8	vs. 42.9	+
3	22.9	vs. 42.9	-
4	30.2	vs. 42.9	-
5	21.8	vs. 42.9	-
6	18.9	vs. 42.9	-
7	61.8	vs. 42.9	-
8	40.6	vs. 42.9	+

2. Content

A session by session review of the content revealed several interesting dynamics. These are summarized below and described by the excerpts.

a. Sensitization to racial differences. Sensitization to racial differences occurred when intimate topics such as interracial marriage were discussed. This sensitization to racial differences led to expressions of rejection of a prejudicial nature which disrupted group progress.

(1). *1972 group.* Approximately five minutes into the second session, the following dialog emerged:²

BM₂ (to white Ss): "I wondered how open-minded this group was—

² In all excerpts that follow B = black, W = white, F = female, M = male.

about race. —Do you have a brother? —How would you feel if your brother —brought a black girl home and said this is my wife?"

BF₁ and BF₂ teased BM₂ and distorted his question and delayed a response from the white Ss. Then they articulated their own positions:

BF₂ (to BM₂): "Me personally, I wouldn't like it, I wouldn't dig it at all." [BM₂: "Why?"] "I'll tell ya—OK because number one there's a shortage of so-called eligible black men—and for a black man to go and get a white woman is making it shorter for me—"

The white Ss supported the idea that interracial marriages were acceptable. BF₁, BF₂, and BM₁ were strongly against the concept. BF₁ ended the discussion by calling BM₂ "uncle." The white Ss faced overt rejection for the first time, and the black Ss' previous ingroup unity was broken. The group was rendered almost nonfunctional for the next 1½ sessions.

(2). 1973 group. BM₂ led the group into a discussion which sensitized them to their racial features and to interracial attraction:

BM₂ (to WM₁): "I'd like to know your feelings toward black women."

WM₁ (to BM₂): "I'm kind of confused about how I feel toward black women—except I feel uncomfortable."

BM₂ (to group): "I just want to know, can we look at each other cross-racially enough to see beauty in each other although our beauty might have different standards."

Leader (to group a few minutes later): "The question seems to be: Am I beautiful across racial lines?"

BM₂ (to group): "Blacks have certain characteristics, physical features that are different than the average white—bigger lips, wider noses. —I think there are pretty women in this group—(gesturing toward the two BF_s but speaking to WM₁). Do you look upon them as women, or. . .?"

WM₁ (to BM₂): "Sure I look upon them as women. That's the first thing that comes to my mind—that they are women."

BF₂ (to WM₁): "I'm wondering if you have two different standards for beauty?"

WM₁ (to BF₂): "Beauty is beauty—"

BF₂ (to WM₁): "We're so different. I'm wondering if we have one set of standards for both blacks and whites."

Once the group became sensitized to their racial differences, the prejudices emerged. The first rejection of the possibility of intimacy was based upon religion:

WF₂ (to group): "—I guess most people have noticed I have a certain

religious preference . . . and that has made me very conscious of avoiding situations that I don't want to get into . . . I don't allow myself to get involved or into certain circumstances where I could get involved with certain people or where there would be no future. I have my own limits as to who I can get personally involved with. —I kinda think that's a cop-out, but that's how I feel. —It's not a problem of black and white; it's my own little problem."

BF₂ (to *WF₂*): "I don't see where it's any problem."

WF₂ (to *BF₂*): "I wear a Star of David [pointing to it]. I'm Jewish. It's reality. It of necessity makes me restrict myself. —What I'm saying basically is that I feel that a long term relationship must be with someone who's Jewish. —Sammy Davis, Jr., is the only black Jew I know of."

BF₂ (to *WF₂*): "I have my limitations too. I like my men tall, dark, and handsome [pause] and when I say dark, I mean DARK."

WM₁ (to *BF₂*): "Are you subject to change?"

BF₂ (to *WM₁*): "No, no I'm not . . . not as I see myself now."

For the next two sessions blacks and whites chose to sit in a segregated pattern.

b. Social pressures. Social pressures and censorship operated in the groups in a manner similar to the outside world. The following examples are from sessions 6, 7, and 8 of the 1973 group:

(1). *Session 6.*

BM₂ (to group): "Do you think it's because we don't want to know each other and because we don't want to get our relationship any closer than it is?"

WF₂ (to *BM₂*): "Well I think [pause] ah [pause] yes and no [pause]. I think we care; I think we're frightened to a certain degree."

WM₁ (to *BM₂*): "I wonder about the risk, you know, that's involved. I'm feeling the pressure of what do they really think about what I've said."

Leader (to *WM₁*): "About your relating positive feelings with *BF₂* (last week)?"

WM₁ (to leader): "Yeah."

(2). *Session 7.*

BF₂ (to *WM₁*): "I'm feeling a little pressure right now still. Ah, I feel better in communicating with you [pause] my ears aren't burning, you know." [*WM₁* (to *BF₂*): "That's beautiful."] "But I still feel a little bit of pressure wondering what our other group members really feel, what are they thinking. —And I'm wondering how much I can give, how much I can receive in the communication from you without jeopardizing my relationship with

other group members—that pressure's still there. I wish there was some miracle eraser that could take it from me. (to WM₂) I guess I'm kinda feeling left out when it comes to you [pause] I'm struggling for the words, I'm trying not to say anything to upset you. That's where my struggle comes from."

(3). *Session 8.* The earlier questions of the social acceptability of close relationships between blacks and whites was revived. WM₁ and BM₂ asked how the others reacted to interracial heterosexual contact within the group. The two principal censors reacted negatively:

BF₁ (to group): "I'd be angry if WF₂ were to sit on BM₂'s lap."
[BM₂: "At who?"] "At you." [BM₂: "Why?"] "I don't know [pause] because nine times out of 10 I'd think you initiated it." [WF₁: "How would you feel toward WF₂?"] "I don't know [pause] I guess I'd be angry at her also."

WM₂ looked angry but would not respond to questions about it. Finally WF₁ got up and went over to BM₂ and sat on his knee. This evoked more nonverbal anger from WM₂ but no verbal acknowledgement of it. BM₂ responded by telling WM₂ where their relationship stood and terminated any further attempts to communicate:

BM₂ (to WM₂): "I don't feel like you want to get involved in communicating with me—I feel that if you won't express your feelings that you really don't want to get involved."

c. *Use of "we" instead of "I" by 1972 black Ss.* Without the "here-and-now" rule of the 1973 group, the 1972 black Ss tended to speak collectively, often using "we" instead of "I." Toward the end of session #1 of the 1972 group WM₁ and WF₂ pointed out the use of "we" by the black Ss.

BM₁ (to white Ss): "We're looked at collectively and so we're coming in and speaking in collective terms. —(to leader) The white society outside makes us do that, why should we differentiate when we come in here?"

d. *Exclusion of white Ss.* The black Ss used a covert communication system designed to exclude the white Ss from their ingroup discussions.

(1). *1972 group.* The leader confronted the black Ss during the fourth session regarding the nonverbal ingroup communication he had observed:

Leader (to black Ss): "Let me toss out an issue—what about open communication by blacks in front of Whitey, like right here, like right now. OK, now to the degree that that is a good thing to do, or a bad thing to do, is there some kind of common base?"

BM₁ (to leader): "Yeah, it's a common base."

Leader (to BM₁): "OK. What's the common base?"

BM₁ (to leader): "That it's a bad thing to do probably."

Leader (to BM₁): "Open communication?"

BM₁ (to leader): "Right."

Leader (to BM₁): "In front of Whitey, it's a bad thing to do?"

BM₁ (to leader): "Right."

(2). 1972 group. The covert communication seemed to stem from a striving for a consensus among the black Ss:

Leader (to BF₂): "OK so there's a subcommunication going on among the blacks where they know what they're saying regardless of whether—they might mean 'yes,' say 'no' and they know it's going on—. [BF₂: "Right."] —You're saying that we can say anything, but all know what each other means within the black group."

BF₂ (to leader): "Yeah to a certain extent—."

Leader (to BF₂): "—you're saying that among the blacks there is more commonality in terms of opinions about things?"

BF₂ (to leader): "On certain issues that are going on at the time, right."

Leader (to BF₂): "So that in here you can kind of sense where the other three black members of this group are on a given issue by knowing where you are on the issue?"

BF₂ (to leader): "Yeah."

e. *White inability to express anger toward blacks.* White Ss reported an inability to express legitimate anger toward blacks.

WM₁ (to BF₂): "—It seems like I can disagree with WM₂ right now or disagree with WF₂ and feel pretty comfortable about it. Yet if I were to have an argument with you BF₂, I feel an extra added element there. I can't quite put my finger on it—I couldn't express myself as well. (to WM₂) You know, WM₂, you and I could really fight or WF₂ and I could fight."

WM₁ (to WF₂): "You really couldn't express your real gut feeling—especially toward blacks."

WF₂ (to WM₁): "Not anger. Not anger! (to group) This is like outside—I've noticed and I [pause] parking lot attendants [embarrassed laugh] like I got real mad because this guy broke my car and because he was a white redneck, I just let him have it. If he'd been black, I couldn't have. I know I wouldn't have."

f. *Distortion of messages.* Black-white communication was difficult at times because expectations distorted the messages. In the 1972 group in the fourth session WF₁ tried to pay BM₁ a compliment, but it was initially distorted by him:

WF₁ (to BM₂): "I admire people who are really strong in what they

believe and that really back it up and do something about it. You know that just don't talk about it.—"

Leader (to WF_1): "Who would that be in here?"

WF_1 (to leader and BM_1): "BM₁ I think probably."

BM_1 (to WF_1): "What are you saying though that, that you think I talk it but I don't want—[interrupted by WF_1]."

WF_1 (to BM_1): "No. No. I said I think you probably live up to the things you're saying—."

BM_1 (to WF_1): "All right. I took it the other way. I thought you were saying that—I do a lot of talking but I don't back it up."

WF_1 (to BM_1): "No. No. I was feeling the opposite way. You know, that you were trying to do something."

BM_1 (to WF_1): "Thank you."

g. Response sets predetermined. Some of the Ss came to the groups with response sets predetermined by their experiences with and/or perceptions of interracial relations.

(1). *1972 group.* BF_2 expressed rather strong aversions to close relations with whites. She was then asked what it would take to change her attitudes.

BF_2 (to BM_1): "I would have to, like from the beginning of birth, like up to this point, have experienced a different life."

(2). *1972 group.* BM_1 talked about his early training in survival tactics taught to him by his mother. He translated this into several implications for interaction:

BM_1 (to white Ss): "—it's a fool who is caught in the middle—if sides are chosen, your color determines which side you're on—they're picking sides now. —Proceed with caution—you know—don't go this way or too far that way, just feel 'em out—but always expect the worst. —My parents taught me alot of Christianity—we should love our brothers—even the white man is my brother whether he wanted to believe it or not—that's why I have two things pulling at me you see, I'd like to get close to you, but like I'm frightened—."

D. DISCUSSION

The results of both the statistical and content analyses have implications for describing the nature of prejudice, group dynamics, and strategies for the reduction of prejudice.

"Prejudice" has been described as a complex phenomenon (12) and shown to have specific components rooted in experience and a general component, or response set, stemming from the personality of the respondent (16). These

two components were demonstrated in this study. On the basis of their experiences, the black Ss and white Ss came to the group with different expectations and goals. White Ss came to learn more about blacks, to demonstrate their open-mindedness, and to avoid any indications of prejudice on their part. Thus we see their disproportionate attention to the black Ss at the expense of the other white Ss (Tables 2 and 3); their surprised and hurt reaction to the black Ss' rejection of the possibility of intimacy with whites; and their inability to express, or even conceptualize, legitimate anger toward a black person. The black Ss, on the other hand, came to teach the white Ss about "being black." Thus we see their biased communication focused inward (Table 2) in an attempt to reach consensus on issues before one of their more verbal members, acting as a spokesman for the black subgroup, attempted to communicate it to the white Ss; their frustration at not always being able to find a common position; their use of "we" rather than "I" when speaking to white Ss; and their covert communication system used to distort both differences of opinion and arguments within the black subgroup when it was undesirable to communicate these matters to the white Ss. Individual differences, however, were important within each subgroup. Both black subgroups had a member who served as a communication link between the black Ss and the white Ss (BM₂ in 1972 and BM₂ in 1973). Each acted as a stimulus by initiating sensitizing topics, such as interracial marriage or physical attractiveness, and by taking personal positions which occasionally placed him at odds with his black peers. Both black groups had a group spokesman (BM₁ in 1972 and BF₂ in 1973). The white groups had neither a link nor a spokesman because they operated as individuals without concern for one another. In 1973, WF₁ did act as a stimulus at times but rarely assumed responsibility for other leadership functions. In 1973, both the black subgroup and the white subgroup had censors (BF₁ and WM₂) who made covert attempts to restrain members of their own subgroups from interacting in an intimate, or open, manner with members of the other race.

The T-groups operated as mini societies with all of the pressures for role conformity that existed in the outside world. Because of this they provided an excellent opportunity for reality testing (4). However, such interpersonal experimentation was frightening to most of the Ss. The open sharing of stereotypes as a starting point for testing the degree of perceived similarity within the group was socially unacceptable, especially to the white Ss. Interracial physical contact was taboo. Certain topics with high threat potentials in the outside society were too hot to handle and tended to split the group into defensive subgroups.

The 1972 white Ss exhibited a consistent communication bias throughout the sessions, and the 1973 white Ss maintained the same outgroup bias for six consecutive sessions (Table 4). This pattern is in agreement with Campbell's (6) assertion that messages tend to be assimilated according to the mode of prior communications. The black Ss, on the other hand, broke the consistency of their ingroup bias in both treatment groups. This change may be explained in terms of stimulating the racial variable. According to the content analysis, the outgroup-directed sessions for the black Ss dealt with, or followed, sensitive topics, such as interracial marriage and physical attraction, which the black Ss initiated. In doing so, the black Ss focused the group on prejudicial stereotypes and sensitized the members to ingroup-outgroup differences. Their open expression of stereotypic behaviors, in contrast to the white Ss, gave them an opportunity to explore and evaluate their prejudices. The content analysis and statistical tests suggest that this experience weakened the prejudicial responses on the part of the black Ss. These results are in contrast with the investigations of Hendrick and Rumenik (9) dealing with the activation of racial prejudice within the context of group discussions.

Allport (2) proposed a tentative law regarding the reduction of prejudice:

Prejudice tends to diminish whenever members of different groups meet on terms of equal status in the pursuit of common objectives (p. 246).

His "law" has evolved from his earlier specifications for the type of contact which would reduce prejudice (1) and has been verified in the research literature (5, 14, 19). The Ss in the present study met all of the conditions specified by Allport in both his 1954 and 1960 writings. However, the results did not demonstrate a consistent reduction of prejudice. This is similar to the inconsistent results reported in the literature when contact is used as the experimental variable. Several well-designed studies have shown that contact reduces prejudice (8, 10, 13, 16, 22), whereas others have described no effect or an increase in prejudice (3, 11, 17, 20, 21). The present data suggest that some contact may in fact reinforce prejudice: e.g., contact in which biased communication is not openly explored, but allowed to persist. In the opinion of the writers, only three of the 16 Ss became substantially less prejudiced as the groups progressed (BM₁ in 1972 and BF₂ and BM₂ in 1973), two may have become more prejudiced (BF₁ and WM₂ in 1973), and the others remained essentially unchanged.

Prejudice seems to be a consistent phenomenon which is resistive to change. This was true for the white Ss in these treatment groups. The percentage of ingroup statements made by the 1972 white Ss approached the expected

during the last session, whereas it approached the expected for the 1973 white Ss during the last two sessions. The efficacy of the group treatment probably cannot be tested unless a rather lengthy treatment is planned or unless no fixed termination point is specified. Group members need time to break the consistency of their prejudiced communication patterns. Perhaps the white Ss also needed time to wear down the social desirability of appearing to be more open-minded than they really were with regard to racial issues.

In conclusion, this study provided some objective evidence regarding the persistence, degree, and nature of communication bias which existed among black and white Ss all of whom were in training to become professionals in a discipline where communication between counselor and client is the *sine qua non* of treatment. Content analyses suggested that the ingredients of the biased communication in the groups were similar to those operating in the larger society.

REFERENCES

1. ALLPORT, G. W. *The Nature of Prejudice*. New York: Doubleday-Anchor, 1954.
2. ———. *Personality and Social Encounter*. Boston: Beacon Press, 1960.
3. AMIR, Y., BIZMAN, A., & RIVNER, M. Effects of interethnic contact on friendship choices in the military. *J. Cross-Cult. Psychol.*, 1973, 4, 361-373.
4. BACK, K. W. *Beyond Words*. New York: Russell Sage Foundation, 1972.
5. BURNSTEIN, E., & MCRAE, A. V. Some effects of shared threat and prejudice in racially mixed groups. *J. Abn. & Soc. Psychol.*, 1962, 64, 257-263.
6. CAMPBELL, D. T. Systematic error on the part of human links in communication systems. *Informat. & Control*, 1958, 1, 334-369.
7. GOLDSTEIN, A. P. *Psychotherapeutic Attraction*. New York: Pergamon Press, 1971.
8. HARLAN, H. H. Some factors affecting attitude toward Jews. *Amer. Sociolog. Rev.*, 1942, 7, 816-827.
9. HENDRICK, C., & RUMENIK, D. K. Race versus belief about race as determinants of attraction: Belief prejudice and two kinds of race prejudice. *J. Res. Personal.*, 1973, 17, 148-164.
10. HOFFMAN, J. E., & ZAK, I. Interpersonal contact and attitude change in a cross-cultural situation. *J. Soc. Psychol.*, 1969, 78, 165-171.
11. HOGREFE, R., EVANS, M. C., & CHEIN, I. The effects on intergroup attitudes of participation in an inter-racial play center. *Amer. Psychol.*, 1947, 2, 324 (abst.).
12. KRAMER, B.M. Dimensions of prejudice. *J. of Psychol.*, 1949, 27, 389-451.
13. LUNDBERG, G. A., & DICKSON, L. Selective association among ethnic groups in a high school population. *Amer. Sociolog. Rev.*, 1952, 17, 23-35.
14. MANNHEIMER, D., & WILLIAMS, R. M., Jr. A note on Negro troops in combat. In S. A. Stouffer, E. A. Suchman, O. C. DeVinney, S. A. Star, & R. M. Williams, Jr., *The American Soldier (Vol. 1)*. Princeton, N. J.: Princeton Univ. Press, 1949.
15. NEWCOMB, T. M. The prediction of interpersonal attraction. *Amer. Psychol.*, 1956, 11, 575-586.
16. PATTERSON, D. L., & SMITS, S. J. Reactions of inner-city and suburban adolescents to three minority groups. *J. of Psychol.*, 1972, 80, 127-134.

17. RAM, P., & MURPHY, G. Recent investigations of Hindu-Moslem relations in India. *Hum. Organiz.*, 1952, **11** (2), 13-16.
18. SIEGEL, S. Nonparametric statistics for the Behavioral Sciences. New York: McGraw-Hill, 1956.
19. STAR, S. A., WILLIAMS, R. M., JR., & STOUFFER, S. A. Negro infantry platoons in white companies. In E. E. Maccoby, T. M. Newcomb, & E. F. Hartley, *Readings in Social Psychology*. New York: Holt, Rinehart & Winston, 1958.
20. TRIANDIS, H., & VASSILIOU, V. Frequency of contact and stereotyping. *J. Personal. & Soc. Psychol.*, 1967, **7**, 316-328.
21. WINDER, A. E. White attitudes toward Negro-white interaction in an area of changing racial composition. *Amer. Psychol.*, 1952, **7**, 330-331.
22. WORKS, E. The prejudice-interaction hypothesis from the point-of-view of the Negro minority group. *Amer. J. Sociol.*, 1961, **67**, 47-52.

Department of Counseling and Psychological Services

Georgia State University

University Plaza

Atlanta, Georgia 30303

BODY-CATHEXIS AND SELF-ESTEEM: THE IMPORTANCE OF SUBJECTIVE IMPORTANCE*

Department of Sociology-Anthropology, Western Washington State College

E. R. MAHONEY

SUMMARY

Research investigating the relationship between body-cathexis and self-esteem has frequently dealt with the problem of the use of body-cathexis scores weighted by the S's rating of the personal importance of body aspects. Since the original research in this area, two studies have presented contradictory data testing the hypothesis that the greater the importance of body aspects to the individual, the greater the correlation between self-esteem and body-cathexis. This hypothesis is tested here using several approaches to the question. These data clearly indicate that there is no relationship between Ss' subjectively stated importance of body aspects and statistical importance in the form of correlations between body-cathexis and self-esteem.

A. INTRODUCTION

Since the original Secord and Jourard (4) finding of a relationship between body-cathexis and self-cathexis, a large volume of research has been accumulated dealing with these two dimensions of self-perception. One issue in this research has been how important aspects of the body are to the individual and how this importance factor affects the relationship between self-cathexis and body-cathexis. Rosen and Ross (2) argued that the positive correlation observed by Secord and Jourard should be considered in light of the importance the individual attaches to various aspects of his or her body. Rosen and Ross divided body aspects at the mean in importance rating and found that for those rated below mean importance $r = .28$, while for those rated above mean importance $r = .61$. Rosen and Ross suggested that a refined analysis of the body-cathexis and self-cathexis relationship take into consideration the self-rated importance of body aspects in the form of a cathexis score weighted by importance. This suggestion was based on the argument

* Received in the Editorial Office on June 5, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

that as subjective importance of body aspects increases, so should the correlation between body-cathexis and self-cathexis. The weighted cathexis hypothesis was tested by Lerner *et al.* (1) by comparing the correlation between mean body-cathexis (a mean over all measured body aspects) and self-concept with the correlation between mean weighted (by importance) cathexis and self-concept. Lerner *et al.* found no significant difference between the two correlations for either males or females and concluded that there is no support for the Rosen and Ross hypothesis that as the subjective importance of body aspects increases, so does the correlation between body-cathexis and self-cathexis. Since the Lerner *et al.* analysis employed a *mean* weighted and unweighted cathexis score, it is possible that the correlation does in fact increase as subjective importance increases. If body aspects low in importance have a lower than average correlation between body-cathexis and self-cathexis, and highly important aspects have a higher than average correlation, the result may be cancellation of the effect of importance when using a mean cathexis score, resulting in no difference between weighted and unweighted correlations. Since the Rosen and Ross data strongly supported the logical argument that subjective importance should be reflected in statistical importance, the research reported here was undertaken in an attempt to delineate clearly the effect of subjective importance ratings on the relationship between body-cathexis and self-cathexis.

B. METHOD

A standard body-cathexis and body-importance questionnaire was administered to 129 females and 98 males in two upper division sociology classes. On the body-cathexis instrument Ss rated a number of body aspects on a seven-point scale of satisfaction. On the body importance scale, Ss rated how personally important each listed body aspect was to them using a five-point scale. Each S also completed the Rosenberg (3) Self-Esteem Scale. All Ss were tested in respective classrooms, and participation was voluntary.

C. RESULTS

First, an attempt was made to replicate the Lerner *et al.* finding of no significant difference in the correlation of body-cathexis with self-esteem between a weighted and unweighted (by importance) mean cathexis score. For males and females, respectively, the correlation (r) between mean unweighted body-cathexis and self-esteem was .45 and .37. For weighted body-cathexis the respective correlations were .37 and .41. The lack of a significant difference between these two sets of correlations confirms the Lerner *et al.* finding.

Secondly, to provide a more detailed examination of the weighted *versus* unweighted correlations, r values were computed between body-cathexis and self-esteem with both weighted and unweighted scores *for each body aspect* rather than a mean cathexis score over all body aspects. For the males' 23 body aspect correlations, none of the weighted r values was significantly different from the unweighted. This was also the case for the females' 21 correlations.

To test the Rosen and Ross hypothesis that the correlation between body-cathexis and self-esteem increases as the subjective importance of the body aspects increases, the mean body-cathexis scores (unweighted) for all body aspects in each of the five importance categories were correlated with self-esteem. This procedure produced five pearsonian r values for each sex: one r between body-cathexis and self-esteem for each importance category. Following Rosen and Ross, we should observe low correlations for category 1 (not important at all) and increasingly higher correlations through category 5 (very important). For the males, the respective correlations from importance categories 1 through 5 were .45, .35, .23, .24, and .49. For the females, the respective correlations were .16, —.01, .38, .18, and .35. For males, the highest correlations between body cathexis and self-esteem are in the lowest and highest importance categories. For the females there is no distinct pattern, with the middle and highest importance categories having the highest correlations. These data clearly do not support the Rosen and Ross hypothesis. Particularly nonsupportive is the male case. These data clearly suggest that subjective importance is not related to statistical importance. To examine the Rosen and Ross hypothesis in another manner, a second test was conducted on the relationship between subjective importance and statistical importance. The rank order correlation (r_s) was computed between the sample mean importance rating of each body aspect and the correlation (r) between body-cathexis and self-esteem for that aspect. For the males, $r_s = .30$, $p > .05$, while for the females $r_s = .48$, $p < .05$. There is very little or no rank order correlation between the subjectively rated importance of body aspects and the correlation of body-cathexis and self-esteem for those aspects.

D. CONCLUSIONS

The data presented here confirm the Lerner *et al.* finding that weighted body-cathexis scores do not significantly affect the correlation between mean body-cathexis and self-esteem. This is not the result of an averaging effect over all body aspects, but is the case for all individual body aspects. These data indicate that this is the case because there is no relationship between

subjective importance (as defined by Ss) and statistical importance as defined by the correlation between body-cathexis and self-esteem. In terms of how satisfaction with one's body aspects is related to self-esteem, the S's report of the importance of body aspects is clearly irrelevant.

REFERENCES

1. LERNER, R. M., KARABENICK, S. A., & STUART, J. L. Relations among physical attractiveness, body attitudes, and self-concept in male and female college students. *J. of Psychol.*, 1973, 85, 119-129.
2. ROSEN, G. M., & ROSS, A. O. Relationship of body image to self-concept. *J. Consult. & Clin. Psychol.*, 1968, 32, 100.
3. ROSENBERG, M. Society and the Adolescent Self-Image. Princeton, N.J.: Princeton Univ. Press, 1965.
4. SECORD, P. F., & JOURARD, S. M. The appraisal of body-cathexis: Body-cathexis and the self. *J. Consult. Psychol.*, 1953, 17, 343-347.

Department of Sociology-Anthropology
Western Washington State College
Bellingham, Washington 98225

UNWILLINGNESS TO COMMUNICATE, ANOMIA-ALIENATION, AND COMMUNICATION APPREHENSION AS PREDICTORS OF SMALL GROUP COMMUNICATION*^{1,2}

Division of Communication Studies, University of Florida

JUDEE K. BURGOON AND MICHAEL BURGOON

SUMMARY

This investigation created a new 26-item scale to measure a construct labeled unwillingness to communicate. In conjunction with measures of communication apprehension, anomia, and alienation, the scale was used to predict small group interaction behavior. The scale was the best predictor of tension in the small group. The reliability, criterion-related validity, and potential utility of the scale are discussed.

A. INTRODUCTION

One of the goals of communication research is to predict communication outcomes based upon the identification of human variables that affect the communication setting or system. One approach has been to use personality variables as predictors of actual communication behaviors. There has been considerable difficulty in clearly specifying communication behaviors that are associated with specific personality syndromes. Moreover, such an approach has limited utility because it may not be possible in many situations to identify personality types, and because even knowing a personality type allows only indirect prediction of actual communication outcomes. Further, personality variables can neither be manipulated in research nor easily changed in reality. A more useful approach might be to identify general communication sets: i. e., attitudinal and behavioral communication patterns. Identifying predispositions toward communication and actual behaviors would place emphasis on the direct prediction of communication outcomes rather than relying on indirect predictions from personality measures.

* Received in the Editorial Office on June 10, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to thank Allen N. Weiner for his effort in collecting the interaction data.

² Requests for reprints should be sent to Michael Burgoon at the address shown at the end of this article.

One such communication set suggested by previous personality and communication research can be labeled unwillingness to communicate. Several lines of personality research are logically and empirically related to the construct. Anomia-alienation research (1, 2, 5) clearly points to an unwillingness to communicate as part of what is being tapped. Anomies tend to feel shut off from communication (8) and are likely to withdraw from it (4, 7, 9). The overall implication is that anomies distrust communication with others and avoid it. The characteristics of people with low self-esteem also suggest an unwillingness to communicate, based not on distrust but on prior lack of success with communication (10, 11). Like people with low self-esteem, introverts do not necessarily distrust communication, but their characterization as timid and quiet indicates an unwillingness to communicate.

A final area of research that points to an unwillingness-to-communicate set has been labeled communication apprehension. Although there are various forms of communication-bound anxiety (6, 12), the communication apprehensive is generally unusually quiet, tends to avoid interaction, is threatened by face-to-face contact, and is intimidated by subordinates (15). Extensive research demonstrates that whatever the reasons for communication-bound anxiety, people who are anxious are unwilling to communicate in a variety of situations.

In summary, evidence from these variables combined suggests that a generalized set for unwillingness to communicate does exist. The personality syndromes reviewed all include unwillingness to communicate as a part of what is being measured. However, all of these syndromes measure more than just unwillingness to communicate. Moreover, the unwillingness-to-communicate set appears to be multidimensional and due to various causes (e. g., distrust, apprehension, etc.). If the set is multidimensional, it is highly unlikely that any single personality variable could predict or substitute as a measure of the entire set.

Since prior to this investigation no instrument existed that could adequately tap the general unwillingness-to-communicate set, the first stage of this study was the construction of an instrument that could measure several dimensions of the set and replace the personality measures as direct predictors of communication behavior. By not including items that were specifically noncommunication related, by creating items representing all of the personality measures that were relevant to an unwillingness-to-communicate syndrome, and by using items specifically designed to tap a predisposition toward communication, it was felt that more variance could be explained in actual communication behavior.

The second stage of this study tested the above assumption by using the instrument to predict actual communication outcomes. In this validation stage, the small group was chosen as the ideal arena for examining unwillingness to communicate, because in such a setting the person who has a negative orientation toward communication has a greater opportunity to avoid communicating than in a dyadic situation.

The literature on anxiety and personality variables suggests several behaviors likely to be associated with unwillingness to communicate. First, such a person should be brief in his contributions because he perceives communication to be a negative or nonutilitarian experience (e. g., anomics distrust others, persons with low self-esteem feel they have little to contribute, introverts are timid, and communication apprehensives are uncomfortable communicating). Similarly, such a person should be more uninterested in a group's interaction than a person who is willing to communicate. Lack of interest should be further revealed through relatively unrelated contributions, since persons who are unwilling to communicate do not expect their communication to be attended to or to have impact on the group. Finally, such a person should be more tense than persons who are willing to communicate because he would prefer to avoid communication. Accordingly, it was hypothesized as follows:

1. Persons with an unwillingness-to-communicate set will be more brief, uninterested, unrelated, and tense in their small group communication behavior than persons with a willingness-to-communicate set.
2. High anomics will be more brief, uninterested, unrelated, and tense in their small group communication behavior than low anomics.
3. Persons with high communication apprehension will be more brief, uninterested, unrelated, and tense in their small group communication behavior than persons with low communication apprehension.
4. Unwillingness to communicate, anomia, and communication apprehension will be positively correlated and will account for significant variance in small group communication behavior.
5. Unwillingness to communicate will account for more variance in small group communication behavior than either anomia or communication apprehension.

B. METHOD

1. *Instruments*

To measure unwillingness to communicate, an instrument created by Heston and Andersen (9) to measure high school communication behavior was

revised to apply to more general communication attitudes and behaviors. On the basis of a correlational item analysis, a 26-item Unwillingness-To-Communicate Scale was generated.³ The scale items were scored from 1 (strongly disagree) to 5 (strongly agree). The scale was found to have a split-half reliability of .88. To test the validity of the scale, correlations and a regression analysis were run with scales of communication apprehension, anomia, and alienation. Unwillingness to communicate correlated .43 with communication apprehension, .45 with anomia, and .41 with alienation. All three correlations are significant at the .05 level of confidence. Communication apprehension, anomia, and alienation in combination accounted for 35% of the variance in unwillingness to communicate. These results provide support for the concurrent validity of the instrument.

Anomia was measured by the Srole Anomia Scale (14) and the Dean Alienation Scale (14). The Srole scale contains five items with which the respondent may agree or disagree. In the present study, a forced choice, six interval range was used to measure degrees of agreement or disagreement. Previous studies (14) have demonstrated a .90 reliability for the scale, and it has been validated in a variety of sociological studies [*cf.* Clinard (3)]. In the present study the coefficient alpha reliability was .51. The Dean Alienation Scale is another widely used sociological scale measuring three dimensions of alienation: powerlessness, normlessness, and social alienation. It has 24 Likert items, with a split-half reliability in this study of .94. Two measures of anomia-alienation were taken because the two instruments tend to measure different dimensions of the overall anomia-alienation syndrome and because it was deemed valuable to compare the two instruments on their relationship to unwillingness to communicate. The correlation between anomia and alienation was .46, indicating that the two instruments are related but not interchangeable.

Communication apprehension was measured by the Personal Report of Communication Anxiety (PRCA) for College Students (13). The instrument had a split-half reliability of .91 in this study and has elsewhere had a test-retest reliability of .83.

Small group communication behavior was measured by the McCroskey-Wright (13) Interaction Behavior Measure (IBM). The instrument measures six dimensions of interaction. The four of interest to this study, with their respective interrater reliability estimates for each set of raters, were the

³ A copy of the entire 26-item instrument with item-to-total correlations is available on request from the second author at the address shown at the end of this article.

following: verbosity (.95, .88, .90); interest (.92, .84, .92); relevance (.70, .64, .87); and tension (.36, .34, .62). The two items for each dimension were added together and summed across all raters and time periods, producing four interaction scores for each subject. Higher scores indicated higher verbosity, interest, relevance, and tension.

2. Subjects

The Unwillingness-To-Communicate Scale was completed by 283 students at West Virginia University. The sample included a wide cross-section of the university population. The entire sample was used to validate the scale.

The Srole Anomia and Dean Alienation Scales were completed by 202 of the same subjects. The PRCA was completed by 70 students who were also rated with the IBM instrument during group discussion.

3. Procedures

Two weeks prior to observation of the subjects, the PRCA, Anomia, Alienation, and Unwillingness-To-Communicate Scales were completed in class. On the day of observation, students were randomly assigned to groups of five each in class. They were given the task of critiquing their course and generating a list of suggested improvements. They were informed that their discussion would be observed by students from the advanced small groups class, who would be practicing use of an interaction instrument as part of their own coursework. The raters were actually nine trained graduate students who worked in teams of three with each team assigned to observe one of the groups in each class. Each subject was rated six times at five-minute intervals by each of the three raters, resulting in 18 observations per subject.

C. RESULTS

No significant correlations obtained for the dimensions of verbosity, interest, and relevance on Hypothesis 1, but a significant correlation ($p < .01$) for tension of .33 resulted. No significant correlations for Hypotheses 2 and 3 obtained.

Results of the regression analysis for Hypothesis 4 produced significance on only the IBM dimension of tension. With use of the Maximum *R*-square Improvement Procedure (16) the best regression model was anomia and unwillingness to communicate, which together accounted for 20% of the variance, significant at the .001 level. The addition of PRCA and alienation to the regression model did not increase variance accounted for.

Hypothesis 5, that unwillingness to communicate would account for more variance than the other variables, was also supported. It was the first variable to enter the model and accounted for 11% of the variance by itself. In comparison to communication apprehension, anomia, and alienation, unwillingness to communicate had the only significant correlation with any of the variables of interaction ($r = .33$, $p < .05$).

Intercorrelations among the IBM dimensions revealed that the dimensions were not rated as independent dimensions, which is one of the assumptions of the instrument. Verbosity correlated .94 with interest, .69 with relevance, and $-.45$ with tension. Interest correlated .79 with relevance and $-.50$ with tension. Finally, relevance and tension had a correlation of $-.38$. All of these correlations were significant at the .05 level.

D. DISCUSSION

Perhaps the most beneficial outcome of this study was the creation of an instrument measuring unwillingness to communicate which has both criterion-related validity and satisfactory reliability. The advantage of this instrument is its directness in measuring communication attitudes and self-reported behaviors as opposed to instruments from which communication attitudes or behaviors must be inferred. The relatively high correlations with anomia, alienation, and communication apprehension argue in favor of the Unwillingness-To-Communicate Scale as a better predictor of communication predispositions than the other, more restricted instruments used in this study.

The results on the specific hypotheses are less definitive. Only one part of Hypothesis 1 was confirmed, that persons with a higher unwillingness to communicate set will be more tense in their communication behavior. No support was found for Hypotheses 2 and 3, and only partial support obtained for Hypotheses 4 and 5. A significant amount of the variance in tension was accounted for by the predictors of unwillingness to communicate, anomia, alienation, and communication apprehension, with unwillingness to communicate accounting for the most variance.

There are two possible explanations for the failure to find significant results on the other three dimensions of interaction behavior. One is that the IBM instrument was faulty. The intercorrelations among the IBM dimensions reveal that they were not actually independent dimensions, which was the initial assumption of the scale. Since tension had the lowest correlations with the other three dimensions, it may have been the only dimension that operated relatively independently. The high correlations among the other

items meant that if one was not significant, the other items would likely also not be significant.

Upon the basis of these findings alone, we have strong reservations about using the IBM as a measure of small group interaction. There are problems in the original development of this scale that give us such reservations. Moreover, a 12-item scale, whether factor-based or not, is probably not an adequate measure of continuous discourse. We agree with the authors (13) that the scale has high reliability internally; possibly that is the result of nonorthogonal dimensions. Their presumption of validity has not weathered the test of empirical support in this and other studies. Much more effort needs to be expended to measure interaction adequately, and that weakness is conceded in this study.

REFERENCES

1. BARTA, J. A. A study of the concurrence of anxiety and hostility. (Unpublished Doctoral dissertation, Fordham University, New York, New York, 1962.) *Diss. Abst.*, 1963, **9**, 3471-3472.
2. BLOOM, R. Dimensions of mental health in adolescent boys. *J. Clin. Psychol.*, 1970, **26**, 35-38.
3. CLINARD, M. B. *Anomie and Deviant Behavior: A Discussion and Critique*. Glencoe, Ill.: Free Press, 1964.
4. DEAN, D. G. Alienation: Its meaning and measurement. *Amer. Sociolog. Rev.*, 1966, **31**, 753-758.
5. ELMORE, T. H. The development of a scale to measure psychological anomie and its implications for counseling psychology. *Proc. 73rd Ann. Conven. Amer. Psychol. Assoc.*, 1965, 359-360.
6. FRIEDRICH, G. W. An empirical explication of a concept of self-reported speech anxiety. *Speech Monog.*, 1970, **37**, 67-72.
7. GIFFIN, K. Social alienation by communication denial. Research Report No. 32, University of Kansas, Lawrence, 1970.
8. GIFFIN, K., & GROGINSKY, B. A study of the relationship between communication denial and social alienation. Research Report No. 31, University of Kansas, Lawrence, 1970.
9. HESTON, J., & ANDERSEN, P. Anomie-alienation and restrained communication among high school students. Paper given at the Western Speech Communication Association Convention, Honolulu, Hawaii, 1972.
10. HILLSON, J. S., & WORCHEL, P. Self-concept and defensive behavior in the maladjusted. *J. Consult. Psychol.*, 1957, **21**, 83-88.
11. JANIS, I. L., & FIELD, P. B. Sex differences and personality factors related to persuasibility. In C. I. Hovland & I. L. Janis (Eds.), *Personality and Persuasibility*. New Haven, Conn.: Yale Univ. Press, 1959. Pp. 121-137.
12. MCCROSKEY, J. C. Measures of communication-bound anxiety. *Speech Monog.*, 1970, **37**, 269-277.
13. MCCROSKEY, J. C., & WRIGHT, D. W. The development of an instrument for measuring interaction behavior in small groups. *Speech Monog.*, 1971, **38**, 335-340.
14. MILLER, D. C. *Handbook in Research Design and Social Measurement*. New York: McKay, 1970.

A 15-ITEM FORM OF THE F SCALE AND A CROSS-CULTURAL APPLICATION*¹

University of California, Berkeley; and University of Rome

HARRISON G. GOUGH AND RENATO LAZZARI

SUMMARY

Item analyses of the 30-item F Scale in a sample of 355 Ss, and proportionate selection from the nine inferential item clusters first specified for this measure, permitted development of a 15-item version that correlated .95 with the original scale. Application of the shortened version to 194 American and 311 Italian subjects produced nearly equivalent means, but greater variance in the Italian sample. Reliability coefficients were .83 for the American sample and .90 for the Italian. Five items revealed significant differences, interpretable in accordance with known cultural emphases and historical experiences. Testing time for the 15-item scale was approximately five minutes. Complaints about item content were less insistent than typically encountered with the 30-item scale.

A. IMPORTANCE OF THE AUTHORITARIANISM VARIABLE

The program of studies on the authoritarian personality reported by Adorno, Frenkel-Brunswik, Levinson, and Sanford in 1950 (1) has been described in subsequent commentaries as "classic" (3, p. 333; 9, p. 19) and "truly seminal" (6, p. 528), and has led to a vast and still-continuing series of inquiries using either the original 30-item F Scale or derivatives of this measure (*cf.* 2, 4, 5, 8). Furthermore, the F Scale itself and the more general phenomenon of authoritarianism that it seeks to assess are standard topics for discussion in current textbooks on personality (*cf.* 7). In view of the apparent centrality of the concept of authoritarianism in personality theory and the great fund of information available concerning the implications of the scale, new research programs in personality psychology would be well-advised to pay attention to this variable if for no other reason than to permit linkage to significant prior work.

Several years ago the authors embarked on a collaborative study of family

* Received in the Editorial Office on June 10, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Work on this study was supported by grant No. NIH-HD-06589-02 from the National Institute of Child Health and Human Development, United States Public Health Service.

planning, contraceptive preferences, and population psychology, and in compliance with the admonition just given, decided to include a measure of the F Scale syndrome in our work. The full 30-item F Scale as utilized in most of the literature we reviewed was somewhat too long to fit comfortably into the battery of questionnaires necessary to encompass all elements of the study. In addition, some of the original items seemed a bit dated, or worded in such an extreme and dogmatic tone as to provoke negative or antagonistic reactions. Derivative measures, such as the Rokeach scale for dogmatism (8), although excellent tools in their own right, were insufficiently isomorphic with the original F Scale to provide the sought-for linkage. Our conclusion was that a shortened form of the F Scale, with some of the more extreme items eliminated, would best suit our purposes. The discussion below, accordingly, presents background information and current statistical data for the 15-item abbreviation of the F Scale that was developed.

B. DEVELOPMENT OF THE ORIGINAL F SCALE

The first form of the F Scale (1, p. 224) contained 38 items, each generated from hypotheses concerning the psychodynamic bases of ethnocentric and fascistic social attitudes. The items were grouped under nine categories, intended to summarize the major themes discernible among these items: namely, conventionalism, authoritarian submission, authoritarian aggression, anti-intracception, superstition and stereotypy, power and toughness, destructiveness and cynicism, projectivity, and sex (i. e., perception of sexuality as ego-alien). The items were scored on a seven-step scale, going from "agree very much," through "agree pretty much," and "agree a little," down to "disagree very much." On a sample of 295 Ss, the mean score per item was 3.71.

The items were then evaluated by the ratio of the mean of the highest quartile of Ss on total score to the mean of the Ss in the lowest quartile. Nineteen of the 38 items had acceptable ratios and were retained for the second version of the scale, augmented by 15 new ones. The new 34-item scale had a somewhat higher internal reliability than the old one (.87 as compared with .74) and gave a mean item value of 3.42 on a sample of 226 Ss. The discrimination ratios for these items were better than for the first set, but a few remained borderline, and there were also several rather timebound statements: e. g., "It is more than just chance that Japan had an earthquake on Pearl Harbor Day, December 7, 1944."

A final version of the scale was formulated, dropping seven items from Form 2 and adding three new ones, giving rise to the 30-item F Scale as it is

generally known and used today. All of the nine inferential categories cited above were represented by items in the final form, although only two items remained for the category of destructiveness and cynicism.

This brief recapitulation of the development of the current 30-item F Scale serves two functions in our presentation. First, it demonstrates the inherent openness to change and adaptation of the measure, and second, it suggests criteria for deciding whether to include or exclude any item in a new version.

C. DEVELOPMENT OF THE 15-ITEM F SCALE

The standard 30-item F Scale was administered to an initial American sample of 104 male and 151 female Ss. Fourteen of the males and 35 of the females were noncollege adults, tested in regard to contraceptive preferences and other issues in birth planning; the remaining 206 Ss were students at Berkeley, fulfilling laboratory requirements in introductory psychology courses. Descriptive statistics on the 30-item scale were as follows: males, $M = 86.36$, $SD = 19.26$; females, $M = 84.84$, $SD = 26.35$; and total sample, $M = 85.46$, $SD = 23.73$. Reliability of the 30-item scale as estimated by coefficient alpha for the total sample was .88. The mean item value for the total sample was 2.85, distinctly lower than the mean of 3.84 found for 1518 Ss in the original monograph (1, p. 258).

In our sample of 255 Ss, items were then correlated with total score, with the resulting coefficients ranging from .35 to .67. Fifteen items were selected for retention in the shortened version; within each of the nine inferential categories those items were chosen that had the highest correlations with total score. Except for category six (destructiveness and cynicism), where only one item was retained, all categories are represented by two or more items.

The initial samples were then rescored for this 15-item scale, and the new values correlated with the 30-item scores. For the 104 males a coefficient of .91 was obtained. For females the figure was .97, and for all 255 Ss the coefficient was .95. The 15 items included in the abbreviated version are given below, first in English and, second, as used in our Italian translation.² Ss were asked to respond according to the following scale: +3 = agree very much, +2 = agree pretty much, +1 = agree a little, -1 = disagree a little, -2 = disagree pretty much, and -3 = disagree very much. This sequence,

² The writers wish to thank authors Drs. Daniel Levinson and Nevitt Sanford and Harper and Row, publisher, for their permission to cite these items from the book *The Authoritarian Personality* by T. W. Adorno, E. Frenkel-Brunswick, D. J. Levinson, and R. N. Sanford (1).

with the central or uncertain interval left out, is the same as was used in the original work with the F Scale. For scoring, a constant of 4 is added to each entry, changing the sequence to 7, 6, 5, 3, 2, and 1. Any item left blank is arbitrarily assigned a score of 4.

ENGLISH

1. Obedience and respect for authority are the most important virtues children should learn.
2. No weakness or difficulty can hold us back if we have enough will power.
3. Every person should have complete faith in some supernatural power whose decisions he obeys without question.
4. What the youth needs most is strict discipline, rugged determination, and the will to work and fight for family and country.
5. Nowadays when so many different kinds of people move around and mix together so much a person has to protect himself especially carefully against catching an infection or disease from them.
6. Young people sometimes get rebellious ideas, but as they grow up they ought to get over them and settle down.
7. What this country needs most, more than laws and political programs, is a few courageous, tireless, devoted leaders in whom the people can put their faith.
8. Sex crimes, such as rape and attacks on children, deserve more than mere imprisonment; such criminals ought to be publicly whipped, or worse.
9. People can be divided into two classes: the weak and the strong.
10. There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.
11. Wars and social troubles may some day be ended by an earthquake or flood that will destroy the whole world.
12. Most of our social problems would be solved if we could somehow get rid of the immoral, crooked, and feeble-minded people.
13. The wild sex life of the old Greeks and Romans was tame compared to some of the goings-on in this country, even in places where people might least expect it.
14. If people would talk less and work more, everybody would be better off.
15. Familiarity breeds contempt.

ITALIAN

1. Le virtù più importanti che i bambini dovrebbero apprendere sono l'obbedienza e il rispetto verso l'autorità.
2. Se abbiamo abbastanza forza di volontà non ci ferma nessun ostacolo o difficoltà.
3. Ogni persona dovrebbe avere fede completa in qualche potere soprannaturale alla cui decisioni sottomettersi senza discutere.

4. La cosa di cui ha più bisogno la gioventù è una disciplina rigida, forte volontà e ferma determinazione di lavorare e combattere per la propria famiglia e la propria nazione.

5. Poichè di questi tempi persone di tutti i tipi viaggiano e si mescolano insieme, bisogna che ciascuno si protegga con la massima cura dal pericolo che queste persone possano essere portatrici di malattie.

6. I giovani spesso hanno atteggiamenti di ribellione, ma quando crescono dovrebbero abbandonarli e sistemarsi.

7. Questa nazione ha soprattutto bisogno di qualche capo coraggioso e instancabile in cui le persone possano riporre la loro fiducia, piuttosto che di leggi e di programmi politici.

8. I delitti sessuali come ad esempio la violenza carnale su donne o bambini meritano di essere puniti con qualcosa di più della sola prigione; questi criminali dovrebbero essere frustati pubblicamente o peggio.

9. Le persone possono essere divise in due classi distinte: i deboli e i forti.

10. È difficile pensare a qualcosa di più abietto di una persona che non sente un grande amore, gratitudine e rispetto per i propri genitori.

11. Le guerre e i problemi sociali termineranno quando un terremoto o una inondazione distruggeranno il mondo.

12. Molti degli attuali problemi sociali potrebbero essere risolti se potessimo in qualche modo liberarci delle persone immorali, disoneste o deboli di mente.

13. Le orge sessuali dei Greci e dei Romani antichi sono niente paragonate a quello che succede da noi, anche in ambienti insospettabili.

14. Se le persone parlassero di meno e lavorassero di più, tutti staremmo meglio.

15. L'eccessiva familiarità degenera in disprezzo.

D. APPLICATION TO AMERICAN AND ITALIAN SAMPLES

The English edition of the 15-item scale was administered to a sample of 194 Berkeley students, 106 males and 88 females. The Italian edition was given to a sample of 311 subjects, including 124 male and 108 female students, from the University of Rome and the University of L'Aquila, and 24 male and 55 female professional workers in health-related disciplines. Descriptive statistical findings for total male and female subsamples were as follows: for American males, $M = 48.96$, $SD = 13.48$, and coefficient alpha (reliability) $= .80$; American females, $M = 43.86$, $SD = 15.28$, coefficient alpha $= .86$; Italian males, $M = 42.05$, $SD = 18.71$, coefficient alpha $= .90$; Italian females, $M = 47.96$, $SD = 20.38$, coefficient alpha $= .90$.

The sex differences on mean score were significant in both samples, although in opposite directions: American men scored higher than American women, and Italian women higher than Italian men. Lacking other information, and in light of the arbitrary selection of Ss in both countries, we believe it wise to treat these differences for the time being as sampling error.

A more reliable impression of the functioning of the two versions of the 15-item scale can probably be gained from trends for the total samples in the United States and Italy. Table 1 presents item and total score data for our samples of 194 and 311 Ss in the two countries.

TABLE 1
ITEM AND TOTAL SCORE DATA FOR THE 15-ITEM F SCALE IN
AMERICAN AND ITALIAN SAMPLES

Item	Americans (<i>N</i> = 194)		Italians (<i>N</i> = 311)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1	3.76**	2.05	3.08	2.08
2	4.98	1.74	5.15	1.78
3	2.46	1.72	2.69	2.05
4	2.76	1.76	2.53	1.93
5	2.59	1.70	3.62**	2.14
6	3.22	1.72	2.93	1.97
7	4.38**	2.01	2.39	2.09
8	2.54	1.94	2.37	2.04
9	2.09	1.47	2.27	1.80
10	2.77	1.74	3.16*	2.08
11	2.93*	1.85	2.46	2.15
12	2.56	1.81	2.85	2.19
13	3.43	1.57	3.53	2.06
14	3.51	1.85	3.67	2.27
15	2.64	1.51	2.44	1.77
Total score	46.65	14.54	45.15	19.83

* Higher value, $p < .05$.

** Higher value, $p < .01$.

On total score, the two samples had nearly identical means: 45.15 for the Italian Ss vs. 46.65 for the American. This is an encouraging finding, suggesting that the responses of Ss tested in the two countries were rather similar. It should be noted, however, that the Italian standard deviation of 19.83 is significantly greater than the American sigma of 14.54 ($p < .01$). Alpha reliability coefficients were .83 for the American application and .90 for the Italian.

1. Differences on Specific Items

For all items save #2 ("No weakness or difficulty can hold us back if we have enough will power"), the mean rating assigned by Italian Ss was in the disagree realm; for this one item the mean rating was approximately at the "agree a little" marker. For American Ss, item #2 was also rated at the "agree a little" level, and item #7 ("What this country needs most, more than laws and political programs, is a few courageous, tireless, devoted leaders

in whom the people can put their faith") was one-third of the distance between no opinion or uncertain, and agree a little. The overall mean value for Americans was 3.11, and for Italians 3.01.

Americans gave significantly higher ratings to three of the statements: #1, "Obedience and respect for authority are the most important virtues children should learn," #7, just cited in full, and #11, "Wars and social troubles may some day be ended by an earthquake or flood that will destroy the whole world." The largest of these differences is on item #7, dealing with the need for strong political leadership. The American students were more or less uncertain about this alleged need, whereas the Italians rejected it. Italian experiences with fascist leadership may well have played a part in the unequivocal dubiety expressed in response to this item.

The Italian Ss gave higher ratings to two items: #5, "Nowadays when so many different kinds of people move around and mix together so much a person has to protect himself especially carefully against catching an infection or disease from them," and #10, "There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents." No ready interpretation of item #5 comes to mind, but the difference on item #10 appears to be in accord with the great stress placed on family life and family loyalties by Italian culture.

2. Final Comment

A final comment is in order on the reactions of our Ss to the testing instrument and on the time required to complete the form. In regard to time, nearly all respondents were finished within four or five minutes; in regard to content, there was an occasional complaint about the implausibility of the items, but less frequently or intently voiced than when the 30-item form is employed. It is our belief that the 15-item form of the F Scale may safely be recommended as a convenient device for both intra- and cross-cultural application, and that scores on the 15-item scale will be equivalent in meaning to those on the original 30-item measure.

REFERENCES

1. ADORNO, T. W., FRENKEL-BRUNSWIK, E., LEVINSON, D. J., & SANFORD, R. N. The Authoritarian Personality. New York: Harper, 1950.
2. CHRISTIE, R., & JAHODA, M., Eds. Studies in the Scope and Method of the "Authoritarian Personality." Glencoe, Ill.: Free Press, 1954.
3. GOLDBERG, L. R. A historical survey of personality scales and inventories. In P. McReynolds (Ed.), *Advances in Psychological Assessment*, (Vol. 2). Palo Alto, Calif.: Sci. & Behav. Books, 1971. Pp. 293-336.

4. GROSSMAN, J. C., & EISENMAN, R. Experimental manipulation of authoritarianism and its effect on creativity. *J. Consult. & Clin. Psychol.* 1971, **36**, 238-244.
5. KAGITCIBASI, C. Social norms and authoritarianism: A Turkish-American comparison. *J. Personal. & Soc. Psychol.* 1970, **16**, 444-451.
6. KLEIN, G. S., BARR, H. L., & WOLITZKY, D. L. Personality. In P. R. Farnsworth, O. McNemar, & Q. McNemar (Eds.), *Annual Review of Psychology*. Palo Alto, Calif.: Annual Reviews, 1967. Pp. 467-560.
7. MISCHEL, W. *Introduction to Personality*. New York: Holt, Rinehart & Winston, 1971.
8. ROKEACH, M. *The Open and Closed Mind*. New York: Basic Books, 1960.
9. Scheibe, K. E. *Beliefs and Values*. New York: Holt, Rinehart & Winston, 1970.

Institute of Personality Assessment and Research

University of California

2240 Piedmont Avenue

Berkeley, California 94720

A THEORETICAL EXPLANATION FOR THE INTERMEDIATE LEVEL OF TENSION FOUND IN NONBALANCED *P-O-X* TRIADS*¹

*Pontifícia Universidade Católica do Rio de Janeiro and
Fundação Getúlio Vargas, Brazil*

AROLDO RODRIGUES AND CILIO R. ZIVIANI²

SUMMARY

Empirical evidence has abundantly demonstrated that people report an intermediate level of tension for triadic interpersonal relations of the classical Heiderian *P-O-X* type, when the *P/O* link is negative. Low tension is found in balanced triads and high tension in imbalanced ones when the *P/O* bond is positive. This paper postulates that the opposing forces of balance and of agreement found in all four *P-O-X* triads in which the *P/O* bond is negative, in addition to Newcomb's lack of engagement hypothesis, may also account for the intermediate level of tension found in practically all experiments in this area. Subjects were grouped as Hi and Lo Conformists according to the C Scale of the Comrey Personality Scales, and later asked to rate hypothetical triads with a negative *P/O* bond. The results confirmed the hypotheses that Hi Conformists, who supposedly value agreement with others more than Lo Conformists (or are less bothered by disagreement than the latter), report significantly less tension and less willingness to change *P-O-X* triads with agreement than those with disagreement, when such triads have a negative *P/O* bond.

A. INTRODUCTION

Aside from very few exceptions (6, 25, 26, 29, 30) the overwhelming experimental evidence gives strong support to Newcomb's (12) three-way

* Received in the Editorial Office on June 18, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The work here reported was made possible by a grant given by the American Psychological Foundation to the first author who wishes to express his thanks to the Foundation.

² The authors are indebted to the graduate students of the Instituto de Seleção e Orientação Profissional of the Getúlio Vargas Foundation who took the course on Hypothesis Testing taught by the first author in 1972 while he was an invited professor at that Foundation. These students helped in the data gathering and in the scoring of the instrument used.

distinction among triadic interpersonal relations of the traditional *P-O-X* type proposed by Heider (7, 8). Newcomb suggests that triads of the type $+++$ and $+--$ be considered positively balanced; those of the $++-$ and $+ - +$ type be considered positively imbalanced; the remaining four possible combinations with a negative *P/O* bond ($--+$, $-+-$, $---$, and $-++$) be taken as nonbalanced. In all these configurations of signs, the first one refers to the positive or the negative nature of the *P/O* bond; the second, to the nature of the *P/X* one; and the third, to the nature of the *O/X* link.

Empirical support for Newcomb's proposition can be easily found in the literature (e. g., 1, 4 for experiment I of the *P-O-X* type, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 23, 24, 27). According to Newcomb (12) the negative bond between *P* and *O* in *P-O-X* triads "engenders its own tension, which is independent of the kind of tension that is intrinsic to the notion of balance, as defined by Heider and by others who have followed him. Predictions from my [Newcomb's] hypothesis are that, according to various measures of psychological balance, the four possible *POX* situations in which *P/O* is negative (*a*) will resemble each other more closely than they resemble other situations, and (*b*) will be intermediate between positively balanced and imbalanced situations" (p. 33-34). Despite the few exceptions mentioned at the outset of this paper, the empirical support for Newcomb's hypothesis, particularly in its second part, is such that it led Rodrigues (19) to assert that "given that positively balanced, nonbalanced, and positively imbalanced structures are presented to humans who are asked to report (through different indicators) the amount of tension they experience, a positive monotonic function is found, with positively balanced structures generating the smallest amount of tension, and positively imbalanced ones, the greatest. This has been so often unequivocally found in studies differing in time, locale, and methodology, that there is no more reasonable doubt that this is the way human organisms, in general, behave in such situations" (p. 7-8).

The question of both theoretical and empirical interest that suggests itself at this stage of the development of the balance principle is this: why do the nonbalanced *P-O-X* triads generate an intermediate level of tension (as assessed by a variety of empirical referents) when compared with the positive balanced and imbalanced structures?

Rodrigues (15, 18, 19, 20) suggests that, in addition to Newcomb's notion of lack of engagement in nonbalanced triads, something else can also be responsible for the empirical findings mentioned above. He suggests that the intermediate level of tension found in *P-O-X* triads in which the *P/O* bond

is negative may also derive from the fact that forces of balance and forces of agreement are in opposite directions in these situations. Forces are taken here in the Lewinian sense of a dynamic cause of a given behavior, with direction, intensity, and point of application. As several studies have shown (2, 15, 16, 17, 18, 23, 28) there are several sources of cognitive biases (or cognitive forces) in interpersonal relations. Balance and agreement are, undoubtedly, two of them. If we follow the conventional notation for *P-O-X* triads (that is, the first sign referring to the *P/O* bond, the second to the *P/X* one, and the third to the *O/X* link), we can easily see that balance and agreement go together (lead to the same prediction) when positive balanced (+ + + and + - -) and positively imbalanced triads (+ + - and + - +) are concerned. However, when we look at the nonbalanced triads, the opposite is true: - - + and - + - (balance and disagreement) and - - - and - + + (imbalance and agreement). In other words, whenever nonbalanced triads are concerned, in order to achieve balance, disagreement between *P* and *O* is needed; to achieve agreement, imbalance must be found in the situation. Obviously, balance and imbalance are being taken here in the original Heiderian meaning prior to Newcomb's new terminology.

In two experiments specifically designed to evidence the role of agreement in triadic interpersonal relations, Rodrigues (18) showed that when agreement is mostly valued, people follow the forces of agreement at the expense of not having balance in the interpersonal structure. This experiment, however, only shows that agreement is a source of cognitive bias in interpersonal relations; it does not show that the conflict of forces derived from balanced and from agreement is the reason for the intermediate tension reported by subjects for nonbalanced *P-O-X* triads. The present paper reports an experiment whose purpose is to provide an empirical test for Rodrigues' proposed explanation of the intermediate level of tension usually found among nonbalanced interpersonal relations, according to which balance and agreement forces are in opposite directions in nonbalanced triads.

The theoretical rationale that guided this study was patterned along the lines of Cronbach and Meehl's (5) construct validation in psychological testing. By analogy with the recommendations of these authors for the validation of tests designed to assess constructs of difficult operationalization, we searched for a personality variable that correlates with preference for agreement with others. Once such a variable was singled out and an objective instrument identified to assess people on that personality dimension, we could separate the extremes of the distribution of scores on that factor. If, in fact, the conflict of forces between agreement and balance also accounts

for the intermediate level of tension found in nonbalanced structures, then some hypotheses could be derived and empirically tested, and the results would afford the evaluation of the plausibility of the proposed theoretical account for the phenomenon under scrutiny.

The personality factor chosen for this purpose was Factor C (Social Conformity *vs.* Rebelliousness) of the Comrey Personality Scales. As defined by Comrey (3) individuals high on this factor depict themselves as accepting the society as it is, respecting the law, believing in law enforcement, seeking the approval of society, and resenting nonconformity in others. Among the subvariables that measure this factor, we find need for approval, intolerance for nonconformity, acceptance of social order, etc., which seem to indicate a pattern in which agreement is rewarding and nonagreement costly. Besides the fact of showing a plausible correlation with valorization of agreement, we picked this factor because it could be measured by a valid and reliable instrument—the Comrey Personality Scales—which underwent more than a decade of tests during its construction in the United States and has been adapted and standardized in Brazil by Rodrigues (21). The eight personality factors measured by the instrument emerging clearly in its replication in Brazil, showing an amazing correspondence between the factor structure found with American subjects as fully documented elsewhere (22).

If high conformity individuals (Hi Cs) and low conformity individuals (Lo Cs) value agreement differently, and if agreement is, in fact, an active force operating in *P-O-X* triads, it follows that Hi Cs and Lo Cs should respond differently to *P-O-X* triads of the nonbalanced type. It is difficult to say at this point whether agreement would be so valued by Hi Cs that they would experience little tension in triads of the — — — and — + + types, or if it would be so neglected by Lo Cs that they would indicate low tension in triads of the — — + and — + — types. In any case, differential predictions can be made, on the basis of different responses to the value of agreement by these two personality types.

In accordance with this rationale, the following hypotheses were submitted to empirical test:

1. Hi Cs will rate nonbalanced triads with disagreement more unpleasant than Lo Cs and/or nonbalanced triads with agreement less unpleasant than Lo Cs;
2. Hi Cs will rate nonbalanced triads with disagreement more unpleasant than nonbalanced triads with agreement;
3. Hi Cs will indicate more willingness to see changed the *O/X* bond of nonbalanced triads with disagreement than will Lo Cs and/or less willingness

to see changed nonbalanced triads with agreement than will Lo Cs;

4. Hi Cs will indicate more willingness to see changed the O/X bond of nonbalanced triads with disagreement than of those with agreement.

The dependent variables used were reported unpleasantness and reported willingness to change. The first has become a classical measure since Jordan's (11) pioneer study; the second has been suggested by Rodrigues (16) and proven to be particularly sensitive to agreement bias as documented elsewhere (17, 20).

B. METHOD

1. Subjects

Eighty undergraduate students of two universities of the Rio de Janeiro area, all in their first three semesters of college education, served as subjects. Of those, the 20% at each extreme of the distribution of scores on Factor C of the Comrey Personality Scales were retained, making a total of 32 subjects, 16 with scores falling in the highest 20%, and 16 in the lowest 20%.

2. Procedure

The Comrey Personality Scales (consisting of 10 scales) were administered to a sample of 115 undergraduate students in their entirety. Following this, the subjects were given these instructions:

On each of the following pages you will find (a) a situation described and (b) five scales following it. In each situation two persons and something called *X* are involved. The two persons are you and another person, *O*. The *X* is not specified and may be anything at all toward which you and *O* have a positive or a negative feeling. On the first of the five scales, anchored by the three points "Best," "Neutral," and "Worst," you are to indicate how pleasant or unpleasant the described situation is to you. The scale goes from pleasantness, through a neutral point, to unpleasantness. The right end of the scale, where it says "Worst," indicates the highest degree of unpleasantness. You may make a mark anywhere along the scale to translate as accurately as you can the feeling of pleasantness that you experience. On the next four scales, which have as anchor points "None at all," "Neutral," and "Very Much," I would like you to indicate how much you would want to see the changes described at the top of each scale take place. Here again you may place your mark anywhere along the scale. Your task is the same for each of the eight situations depicted on the following pages.

In the first two of these four scales, the subjects were asked to indicate how much they wanted to change their feeling toward *O*, and toward *X*; in the third scale they were asked how much they wanted *O*'s feeling toward *X* to change; and, finally, in the fourth scale, they were asked how much they

wanted to change their feeling toward *O* only in regard to the particular situation being considered, but not otherwise (this procedure has been used by Rodrigues in previous studies). Out of those 115 subjects, 35 were eliminated on the basis of their scores on the Validity Scale and on the Response Bias Scale of the Comrey Personality Scales. These scales are designed to reveal people who are careless in responding to the instrument and/or try to answer the questions in a socially desirable way. The distribution of scores on the Conformity Scales of the remaining 80 subjects yielded the final sample of 32 *Ss*, taking the extreme 20% from both ends of the distribution. Those with scores in the highest 20% of the distribution constituted the group of *Hi Cs*; those with scores in the lowest 20% of the distribution made up the group of *Lo Cs*.

The ratings of unpleasantness and of willingness to change were converted into scores by placement of a millimeter ruler along each of them, and the scores corresponded to the mark on the ruler indicated by the subject's response. The lowest point was equal to 10, the middle point was 55, and the highest, 99 millimeters. The four task sheets containing all four types of nonbalanced structures were randomized in order for each subject, following a Latin square model. Each *S* then was asked to make 20 ratings. We deliberately excluded positive balanced (+ + + and + - -) and positively imbalanced triads (+ + - and + - +) because, as mentioned earlier, the empirical evidence related to measure of tension in such structures is simply overwhelming. They were not at issue in the present study, and their inclusion in the design would require each *S* to make 40 ratings rather than 20, thus unduly increasing the error variance resulting from fatigue, annoyance, and the like, as far as the *Ss* were concerned.

C. RESULTS

Table 1 depicts the mean scores of unpleasantness and of willingness to change for both groups—*Hi* and *Lo Cs*—for both types of nonbalanced triads, with agreement and with disagreement.

In fact, *Hi Cs* reported more unpleasantness than *Lo Cs* for nonbalanced triads in which disagreement between *P* and *O* occurs, thus confirming the first part of hypothesis 1. *Hi* and *Lo Cs* showed no statistically significant difference between amount of unpleasantness for nonbalanced triads with agreement. Hypothesis 2 for the unpleasantness data was also confirmed; as shown on Table 1, *Hi Cs* found nonbalanced triads with disagreement more unpleasant than those with agreement ($t = 2.15$, $p < .05$ in a repeated measures type of design).

Adding further support to the main predictions related to the unpleasant-

TABLE 1
MEAN RATINGS OF UNPLEASANTNESS AND OF WILLINGNESS TO SEE THE O/X BOND CHANGED
GIVEN BY HIGH CONFORMITY (Hi Cs) AND LOW CONFORMITY (LoCs) SUBJECTS

Subjects	Disagree	Agree	<i>t</i>
	— — + — + —	— — — — + —	
	<i>Unpleasantness</i>		
Hi Cs	82.18	72.50	2.15*
Lo Cs	59.53	67.78	1.08
<i>t</i>	3.01***	.25	
	<i>Willingness to see the O/X bond changed</i>		
Hi Cs	64.03	32.16	3.84***
Lo Cs	43.09	37.68	1.05
<i>t</i>	2.48**	— .77	

* $p < .05$.

** $p < .02$.

*** $p < .01$.

ness data, the interaction between type of nonbalanced triad and score on the Conformity Scale showed an F score of 4.15 for 1 and 30 df , which barely misses the .05 level of significance ($F_{1,30} = 4.17$, $p = .05$).

Hypotheses 3 and 4 relate to the data on willingness to change the O/X bond. Table 1 distinctly shows that Hi Cs indicated much more willingness to change the O/X bond of nonbalanced triads with disagreement than Lo Cs, which confirms the first part of hypothesis 3. This hypothesis also postulated as plausible that Hi Cs would indicate less willingness to change the O/X bond of nonbalanced triads with agreement than would the Lo Cs; the data turned out in the expected direction, but the effect was not strong enough to reach statistical significance. Hypothesis 4 was also clearly confirmed, Hi Cs evidencing much more willingness to change the O/X bond of nonbalanced triads with disagreement than of those with agreement.

The F ratio of the mixed-design analysis of variance carried out with the data of Table 1 for the interaction between type of triad and score on conformity was 7.33 which is significant at better than the .01 level. This significant interaction adds further support to the hypothesized dependence of willingness to change the O/X bond of nonbalanced triads upon the manipulated personality variable: Hi Cs indicated more willingness to change O/X in nonbalanced triads with disagreement, whereas Lo Cs showed almost equal willingness to change this bond in all four nonbalanced triads.

D. DISCUSSION

The results of this experiment give strong support to the theoretical position according to which the intermediate level of tension experienced by people when rating nonbalanced P-O-X triads is due to a conflict of two opposing

tendencies that stem from the cognitive biases of balance and agreement. It is our assumption that agreement and balance contribute independently to reported tension, inasmuch as each is one distinct source of cognitive bias. Therefore, when they are both present in an interpersonal relation of the *P-O-X* type and the *P/O* bond is negative, they will be necessarily biasing the structure in opposite directions. This is not true when the interpersonal relation of this type possesses a positive link between *P* and *O*. Such a rationale allows us to state that despite the fact that in all nonbalanced triads the *P/O* bond is negative, differential predictions can be made on ratings of unpleasantness and on ratings of willingness to see the *O/X* bond changed for personality type to which agreement is more or is less relevant. Such an assertion was clearly substantiated by the data here reported. Consequently, it appears that the intermediate level of tension is commonly found as a result not only of the lack of engagement that a negative *P/O* bond generates (thus engendering its own tension in nonbalanced *P-O-X* triads), but also of the conflict between balance and agreement forces in such triads.

In the light of the data one cannot safely assert, however, whether the differences found are due to a preference for agreement by Hi Cs or to their strong intolerance for disagreement. The main point, nevertheless, is that people who value agreement differently do respond differently when faced with nonbalanced *P-O-X* triads. Table 1 seems to favor the second alternative just mentioned: namely, that Hi Cs are strongly bothered by disagreement, and hence their different response from that of Lo Cs who, apparently, are not much disturbed by it.

It should be noted that Hi Cs reported more unpleasantness on both types of nonbalanced triads (with and without agreement) than the Lo Cs ($F_{1,30} = 8.0, p < .01$). Possibly, Hi Cs are more sensitive both to agreement and to balance forces. If this is true, the rewarding effects of agreement for the Hi Cs in the nonbalanced triads with agreement, although they have lowered the unpleasantness and the willingness to see *O/X* changed as compared to the triads with disagreement, were not strong enough to offset the existing tension of an imbalanced situation in the original Heiderian sense.

Since the approach taken in this paper for the validation of the theoretical explanation presented followed the construct validation type of procedure, it is almost pleonastic to assert that more empirical research is needed to strengthen the evidence here reported. Specifically, the nomological net of variables intertwined with the one singled out here should provide further basis for differential predictions of people's behavior when rating nonbalanced *P-O-X* triads. If more empirical tests logically derived from such a nomolog-

ical net confirm the theoretical account presented for the nonbalanced triads phenomenon, one would be much more confident of the appropriateness of such a theoretical proposition.

REFERENCES

1. ADERMAN, D. Effects of anticipating future interaction on the preference for balanced states. *J. Personal. & Soc. Psychol.* 1969, **11**, 214-219.
2. ALMEIDA CUNHA, M. V. C. Uma análise teórica e empírica da interferência de diversas fontes de tendenciosidade cognitiva no princípio Heideriano do equilíbrio. Unpublished Master's thesis, Pontifícia Universidade Católica do Rio de Janeiro, Brazil, 1973.
3. COMREY, A. L. The Comrey Personality Scale. San Diego, Calif.: Educ. & Indus. Testing Service, 1970.
4. CROCKETT, W. H. Balance, agreement, and subjective evaluations of the P-O-X triads. *J. Personal. & Soc. Psychol.*, 1974, **29**, 102-110.
5. CRONBACH, L. J., & MEEHL, P. E. Construct validity in psychological tests. *Psychol. Bull.*, 1955, **52**, 281-302.
6. GUTMAN, G. M., & KNOX, R. E. Balance, agreement, and attraction in pleasantness, tension, and consistency ratings of hypothetical social situations. *J. Personal. & Soc. Psychol.*, 1972, **24**, 351-357.
7. HEIDER, F. Attitudes and cognitive organization. *J. of Psychol.*, 1946, **21**, 107-112.
8. ———. The Psychology of Interpersonal Relations. New York: Wiley, 1958.
9. HERSHOWITZ, A. Interpersonal agreement and disagreement on objects and values: A preliminary study. Unpublished Doctoral dissertation, University of Kansas, Lawrence, 1954.
10. HOROWITZ, M. W., LYONS, J., & PERLMUTTER, H. V. Induction of forces in discussion groups. *Hum. Relat.*, 1951, **4**, 57-76.
11. JORDAN, N. Behavioral forces that are a function of cognitive organization. *Hum. Relat.*, 1953, **6**, 273-287.
12. NEWCOMB, T. M. Interpersonal balance. In R. P. Abelson, E. Aronson, W. J. McGuire, T. M. Newcomb, W. J. Rosenberg, & P. H. Tannenbaum (Eds.), *Theories of Cognitive Consistency: A Sourcebook*. Chicago: Rand McNally, 1968.
13. OHASHI, M. Sociometric choice behavior and interpersonal perception in a triad. *Jap. Psychol. Res.*, 1964, **6**, 273-287.
14. PRICE, K. O., HARBURG, E., & NEWCOMB, T. M. Psychological balance in situations of negative interpersonal attitudes. *J. Personal. Soc. Psychol.*, 1966, **3**, 265-270.
15. RODRIGUES, A. On the differential effects of some parameters of balance. *J. of Psychol.*, 1965, **61**, 241-250.
16. ———. The psycho-logic of interpersonal relations. Doctoral dissertation, University of California, Los Angeles, 1966.
17. ———. Effects of balance, positivity, and agreement in triadic social relations. *J. Personal. & Soc. Psychol.*, 1967, **5**, 472-476.
18. ———. The biasing effect of agreement in balanced and imbalanced triads. *J. Personal.*, 1968, **36**, 138-153.
19. ———. A survey study on balance theory. Paper read at the XIII Congresso Interamericano de Psicologia, Panamá City, 1971.
20. ———. Psicologia Social. Petropolis, Brazil: Editora Vozes, 1972.
21. ———. As Escalas de Personalidade de Comrey: Tradução e Adaptação Brasileira. Rio de Janeiro: Pontifícia Univ. Católica Press, 1973.

22. RODRIGUES, A., & COMREY, A. L. Personality structure in Brazil and the United States. *J. Soc. Psychol.*, 1974, **92**, 19-26.
23. RODRIGUES, A., & FERREIRA, M. H. Fontes de tendenciosidade cognitiva nas relações interpessoais. *Arq. Brasil. Psicotécnica*, 1967, **2**, 9-21.
24. RUBIN, Z., & ZAJONC, R. B. Structural bias and generalization in the learning of social structures. *J. Personal.*, 1969, **37**, 310-324.
25. SAMPSON, E., & INEKO, C. Cognitive consistency and performance in the autokinetic situation. *J. Abn. & Soc. Psychol.*, 1964, **68**, 184-192.
26. WELLEN, A. R., & THISTLETHWAITE, D. L. Comparison of three theories of cognitive balance. *J. Personal. & Soc. Psychol.*, 1971, **20**, 82-92.
27. WYER, R. S., & LYON, J. D. A test of cognitive balance theory implications for social inference processes. *J. Personal. & Soc. Psychol.*, 1970, **16**, 598-618.
28. ZAJONC, R. B. Cognitive theories in social psychology. In G. Lindzey & E. Aronson (Eds.), *The Handbook of Social Psychology* (Vol. 1, 2nd. ed.). Reading, Mass.: Addison-Wesley, 1968.
29. ZAJONC, R. B., & BURNSTEIN, E. The learning of balanced and unbalanced social structures. *J. Personal.*, 1965, **33**, 153-163.
30. ———. Structural balance, reciprocity, and positivity as sources of cognitive bias. *J. Personal.*, 1965, **33**, 570-583.

Departamento de Psicologia
Pontifícia Universidade Católica
Rua Marquês de São Vicente, 209/263
Rio de Janeiro, Brazil

ENTREPRENEURIAL ACTIVITY AS A FUNCTION OF ACHIEVEMENT MOTIVATION AND REINFORCEMENT CONTROL*¹

University of Missouri-St. Louis and Washington University

DOUGLAS DURAND AND DENNIS SHEA

SUMMARY

Reinforcement control and achievement motivation measures were given to 29 black individuals engaged in operating small businesses, and their level of business activity was assessed 18 months later. Individuals with a high need to achieve were found to be significantly more active than those whose achievement motivation was low. Activity scores of internal locus of control individuals were significantly higher than those of externals. Internals with a high need to achieve were significantly more active than all others. It was inferred from the data that thoughts are most successfully translated into action when the individual feels in control of his fate and recognizes the steps that are instrumental in reaching goals.

A. INTRODUCTION

The relationship between human motivation and performance of activity implies that some force or forces, either external to or residing in the individual, result in activity that would not occur if the force were absent; a "motivated" individual is more active in pursuing goals or objectives than an "unmotivated" person. The concept of motive, at a general theoretical level, is used to describe the relationship between thought and action. The position taken here, similar to the arguments presented by de Charms (4) and Cheln (3), was that thoughts are behaviors and that motives are goal-directed behaviors. The purpose of this field study was to examine how two conceptions of human motivation—locus of reinforcement control and achievement motivation—help us understand how the thoughts of a group of black "small businessmen" are translated into entrepreneurial activities (overt action).

* Received in the Editorial Office on June 20, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Work on this research was supported by funds under Title I of the Higher Education Act of 1965.

1. Reinforcement Control

Numerous studies [see Hastorf, Schneider, and Polefka (5)] have demonstrated that individuals who attribute responsibility for their performance to themselves tend to perceive that they can cause (control) changes in their environment. Those who perceive themselves to be controlled by external forces are more likely to wait to be acted upon and will be less likely to cause changes in their lives.

Rotter (11) developed a measure that differentiates "internals" from "externals"; those individuals who have a generalized expectancy that their "reinforcements" are contingent on their own behavior are designated as "internals," and persons who perceive that what happens to them is contingent on luck, chance, or the whims of others are designated as "externals." The generalized expectation that one can ("internally") control one's life was viewed as a motive-related concept, and Hypothesis I followed:

Black businessmen with an "internal" reinforcement control perception will engage in more business-related activity than those who hold an "external" perception.

2. Achievement Motivation

The achievement motive has been defined (8) as an "associative network," a particular set of thoughts and feelings related to competition with some standard of excellence. With particular reference to the current study, McClelland (9) cited research in which Kock (6, p. 7) reported as follows:

... Finnish knitwear firms headed by men higher in Achievement were more likely to expand faster over a seven year period, as reflected in such measures as increase in the number of workers, in growth value of output, in turnover, and in gross investment.

This study, as an example from a vast literature that has demonstrated the positive relationship between achievement motivation and business activity, led to Hypothesis II:

Black businessmen with high achievement motivation will engage in more business-related activity than those whose achievement motivation is low.

3. Reinforcement Control and Achievement Motivation

In reference to the relationship between thought and action, these two motivational constructs appear to be tapping different aspects of the motive concept. Rotter's concept and measure clearly relate to one's expectation of control. An "external" individual acts "less motivated" because he does not think that what he does affects his fate; therefore, he performs less activity

than one who feels in control. On the other hand, the achievement motivation concept and measure relate more closely to thoughts about the major components of goal-seeking behavior. The individual who has low achievement motivation is less likely to engage in business-related activity because he does not typically think of the instrumental activities that lead to an achievement goal (i.e., overcoming obstacles, utilization of help sources, desire to compete and improve, etc.). It may be concluded that in expressing instrumental concepts as individual "knows what to do" in order to reach his goal.

On the assumption that either an external perspective or a low need for achievement would significantly inhibit activity, Hypothesis III predicted as follows:

Black businessmen with high achievement motivation and an "internal" perception would be more active than "low-internals" or "high-externals."

While Hypothesis I and Hypothesis II predicted "main effects" due to the independent motive concepts, Hypothesis III was expected to explain these data in more precise terms by accounting for the interactions.

B. METHOD

1. Subjects

Twenty-nine adult blacks (22 males and seven females), engaged as owners or managers of small businesses in the inner part of a large midwestern city, served as Ss in the study. They were known to the investigators through participation in university extension seminars conducted for minority businessmen. Each S was paid \$10 for participating in the interview at the conclusion of the study.

2. Instruments and Data Collection

The 29 item forced-choice adult form of the internal-external (I-E) control of reinforcement scale (11) and the measure of achievement motivation were administered to the participants in a group setting. The Thematic Apperception Test (TAT) used to measure achievement motivation (1, 10) contained six pictures in which the stimulus figures were black.²

Approximately 18 months after the initial data collection, each S was interviewed individually and in random order. The interviewer, the senior author, had no knowledge of the S's scores on the motivation measures at the time of the interview.

² See Atkinson (1) and de Charms (4) for a discussion of the development, scoring, and critique of the instrument. The protocols used in this study were obtained from the Behavioral Science Center, Cambridge, Massachusetts.

Adapted from Timmons' (12) extensive study of entrepreneurial activities, the Business Activity Interview (BAI) was used as a composite measure of business activity over the 18 month period of the study. The scoring code for the BAI consisted of 60 nominal items from the 62-item measure developed by Timmons. Forty-nine items were assigned positive scores (+1). They included items from such dimensions as career performance (e. g., worked longer hours, obtained promotion, profits increased); planning activities (e. g., initiated planning and action towards expansion, recycling personal goals, has business subgoals); business expansion (e. g., bought out partner's share of business, sales increased, bought real estate); and new business creation (e. g., facilitated new firm formation, started new firm, sold out existing business). Eleven nominal items (e. g., loss of job, demoted, taxable income decreased) were assigned negative scores (-1). An individual's overall score was obtained by summing across all 60 coding categories.

C. RESULTS

The TAT measure of achievement motivation was scored by a trained clinical psychologist who had consistently maintained interscorer reliability coefficients of .80 to .95 in working with other expert scores. High achievement motivation scores were those above the median of 8 (range 0 to 33). The I-E scale was scored according to the form provided by Rotter (11); "internal" scores were those below the median of 6 (range 0 to 17). Cross-classification of Ss yielded four groups: (a) high achievement motivation-"internal" control, (b) high achievement motivation-"external" control, (c) low achievement motivation-"internal" control, and (d) low achievement motivation-"external" control. The Spearman rank order correlation between the two motive measures was $-.19$; the small correlation, while in the expected direction, did not reach statistical significance.

The BAI measure was scored according to the coding system described by Timmons. The range of the BAI scores was 1 to 22. The means, variances, and *N*s of the BAI data are presented in Table 1.

To meet the demands of the small sample size and because the assumptions necessary for the use of parametric statistical methods were unrealistic for the data, nonparametric statistics were used in the analysis. Raw BAI scores were converted to ranks, and the Kruskal-Wallis one-way analysis of variance across the four groups yielded an *H* of 13.3. This finding, correcting for tied ranks, indicated a significant difference ($p < .01$) across the four groups. Since there apparently exists no method to assess interactions with use of nonparametric analysis of variance methods (2, p. 350), multiple tests be-

TABLE 1
SUMMARY OF BUSINESS ACTIVITY INTERVIEW (BAI)
SCORES BY MOTIVATIONAL CLASSIFICATION

Control of reinforcement	Achievement motivation		Total
	High	Low	
Internal			
\bar{X}	14.0	7.1	11.3
σ^2	24.2	37.5	40.7
N	9	6	15
External			
\bar{X}	6.6	7.4	7.1
σ^2	7.0	17.1	13.7
N	5	9	14
Total			
\bar{X}	11.5	7.4	9.3
σ^2	30.7	25.3	31.9
N	14	15	29

tween combined and individual groups were conducted to test the three hypotheses. Although the Kruskal-Wallis test indicated a general overall effect, it and the following tests cannot be considered independent of one another.

Hypothesis I predicted a main effect on the BAI scores due to the control of reinforcement variable. The statistical analysis revealed that the differences between activity scores of the "internal" Ss ($\bar{X} = 11.3$) and the "external" Ss ($\bar{X} = 7.1$) was in the expected direction and reached statistical significance (Mann-Whitney $U = 65.5$, $n_1 = 14$, $n_2 = 15$, $p < .05$). Thus, Hypothesis I was supported.

Hypothesis II also received statistical support. The difference between the BAI scores of those with high achievement motivation ($\bar{X} = 11.4$) as compared to businessmen with low achievement motivation ($\bar{X} = 7.3$) also was significant (Mann-Whitney $U = 62$, $n_1 = 14$, $n_2 = 15$, $p < .05$).

Hypothesis III was tested by comparing the ranks of the four groups with one another. In each case (three Mann-Whitney tests), the high achievement motivation-internal group had significantly larger BAI scores than the other three groups ($p < .05$); in no case (three Mann-Whitney tests) was there a significant difference ($p < .05$) among any of the three groups with the lower BAI scores. Therefore, Hypothesis III, that the combination of high achievement motivation and a perception of internal control would result in significantly greater activity scores than those of the other groups, was clearly supported.

D. DISCUSSION

This study attempted to demonstrate how two conceptions of motivation relate to overt activities. The small correlation between the locus of control and achievement motivation measures indicated that they may be tapping different aspects of motive-related thoughts. Conceptually, the conclusion is that the expectation of fate control may be independent of specific thoughts about goal-directed behavior.

The test of Hypothesis II supported previous research in that individuals with high achievement motivation tended to translate their thoughts into actions; i. e., they engaged in more business-related activity than those with a low need to achieve. Hypothesis I, that "internals" who felt in control of their fate would be more likely than "externals" to engage in activity, also received statistical support.

The results of the study were best explained by Hypothesis III, which predicted an interaction between the two motive variables. The combination of a high need to achieve coupled with an internal locus of control explained most of the differences in business activity. These data support the contention of Weiner and Kukla (13) that perception about causality is a mediating variable between achievement and performance. An "external" perspective or the relative lack of specific thoughts about goal-directed (low achievement motivation) apparently resulted in an inhibition of activity. Thus, even though a different measure of achievement motivation and a different population were utilized in this research, the results were consistent with a laboratory study reported by Wolk and DuCette (14).

In his discussion of the "achievement syndrome," McClelland (7) noted that achievement motivated persons take personal responsibility for their actions, take calculated risks, and use feedback; these are behaviors relevant to the demands of the entrepreneurial role. The results here indicate that a perception of personal responsibility (internal locus of control) may be a central component in the process of translating thoughts about successful achievement into overt activity.

REFERENCES

1. ATKINSON, J. W., *Ed.* *Motives in Fantasy, Action, and Society*. Princeton, N. J.: Van Nostrand, 1958.
2. BLALOCK, H. M. *Social Statistics*. New York: McGraw-Hill, 1972.
3. CHEIN, I. *The Science of Behavior and the Image of Man*. New York: Basic Books, 1972.
4. DE CHARMS, R. *Personal Causation*. New York: Academic Press, 1968.
5. HASTORF, A., SCHNEIDER, D., & POLEFKA, J. *Person Perception*. Reading, Mass.: Addison-Wesley, 1970.

6. KOCK, S. W. Management and motivation. Doctoral thesis, Swedish School of Economics, Helsingfors, Finland, 1965.
7. McCLELLAND, D. C. The Achieving Society. Princeton, N. J.: Van Nostrand, 1961.
8. ———. Toward a theory of motive acquisition. *Amer. Psychol.*, 1965, 20, 321-333.
9. ———. Motivation Trends in Society. Morristown, N. J.: Gen. Learn. Press, 1971.
10. MURRAY, H. A. Thematic Apperception Test Manual. Cambridge, Mass.: Harvard Univ. Press, 1943.
11. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, 80(1), Whole No. 609.
12. TIMMONS, J. A. Business Leadership Project. Boston: Behav. Sci. Center, Sterling Institute, 1968.
13. WEINER, B., & KUKLA, A. An attributional analysis of achievement motivation. *J. Personal. & Soc. Psychol.*, 1970, 15, 1-20.
14. WOLK, S., & DUCETTE, J. The moderating effect of locus of control in relation to achievement motivation variable. *J. Personal.*, 1973, 41, 59-70.

School of Business Administration
University of Missouri-St. Louis
8001 Natural Bridge Road
St. Louis, Missouri 63121

THE HIERARCHICAL FACTOR STRUCTURE OF THE WISC AND REVISED ITPA FOR READING DISABLED CHILDREN*¹

Public Schools of Columbus, Logan, and Worthington, Ohio

FRED H. WALLBROWN², JOHN BLAHA, DOROTHA H. COUNTS,
AND JANE D. WALLBROWN

SUMMARY

An hierarchical factor solution was obtained on correlations among WISC and ITPA subtests for 110 reading disabled children. The ability hierarchy which included a general (*g*) factor, two subgeneral factors, and five primary factors was arranged in a manner congruent with Vernon's structural paradigm. The *g*-factor was defined by a moderate but distinct pattern of positive loadings from WISC and ITPA subtests. At the subgeneral level a verbal-educational factor was defined by verbal WISC and ITPA subtests, and a spatial-perceptual-mechanical factor was defined by WISC performance and ITPA visual subtests. Three primary factors—freedom from distractibility, verbal precision, and quasi-specific—were defined by WISC subtests. Two primary factors—automatic processes and representational processes—were defined by ITPA subtests.

A. INTRODUCTION

The Wechsler Intelligence Scale for Children (24) and the Illinois Test of Psycholinguistic Abilities (11) are often employed in conjunction to assess the abilities of learning disabled children. Both instruments have received considerable attention from factor analysts. Factor analytic studies of the Wechsler Intelligence Scale for Children (WISC) have been reported by Cohen (8), Osborne (15), and Baumeister and Bartlett (1, 2). The Illinois Test of Psycholinguistic Abilities (ITPA) has received even more attention

* Received in the Editorial Office on June 25, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to acknowledge Miss Rosemary Dassel, Supervisor, Reading Clinic, Columbus (Ohio) Public Schools, for assistance and cooperation with data collection and Dr. Robert J. Wherry, Sr., Department of Psychology, The Ohio State University, for assistance with design and data analysis.

² Request for reprints should be sent to Fred H. Wallbrown at the address shown at the end of this article.

from factor analysts. For example, Meyers (14) was able to locate 16 factor analytic studies of the first edition of the ITPA (13), and even more studies are now available: e. g., Silverstein (17), Ryckman and Wiegerink (16), and Leventhal and Stedman (12).

However, the factorial composition of the WISC and revised ITPA (11) has not been investigated by obtaining an hierarchical factor solution on intercorrelations among the subtests comprising these two tests. Such a solution is necessary to test the applicability of Vernon's (20) hierarchical paradigm which concerns the structural relations among the basic ability dimensions as well as the dimensions themselves. According to Vernon's structural paradigm one would expect to find a general (*g*) factor defined by an overall configuration of positive loadings from WISC and ITPA subtests. Vernon's paradigm also suggests that a verbal-educational (*v:ed*) factor should be defined by a pattern of positive loadings from verbal subtests of the WISC and ITPA subtests, and a spatial-perceptual-mechanical (*k:m*) factor should be defined by a pattern of positive loadings from WISC performance and ITPA visual subtests.

Hierarchical factor analyses of the WPPSI (21), the WISC (23), and the WAIS (22) all indicate that the general factor and two major group factors of Vernon's paradigm provide a parsimonious explanation of the common variance in the Wechsler (24, 25, 26) scales for normal Ss. However, the Wallbrown, Blaha, Wherry, and Counts (23) study indicated a more complex factor structure for the WISC in the case of reading disabled Ss. For reading disabled Ss, the factor structure still included an hierarchical ability arrangement with factors corresponding to *g*, *v:ed*, and *k:m*, but the *g*-factor was considerably weaker and four primary factors emerged. Consequently, one would expect to obtain a relatively weak *g*-factor, two major group factors corresponding to *v:ed* and *k:m*, and various primary factors from an hierarchical analysis of the WISC and ITPA for reading disabled Ss.

The purpose of the present study was, therefore to examine the factorial composition of the WISC and revised ITPA for reading disabled Ss in relationship to Vernon's hierarchical ability paradigm. A computer solution developed by Wherry and Wherry (28) constitutes a suitable method for investigating hierarchical theories of intelligence. This solution eliminated the subjectivity of the original Wherry (27) solution through use of a principal-factor analysis with Minres cleanup to estimate communalities and a varimax rotation for assigning variables to clusters.

A detailed description of the Wherry-Wherry solution is beyond the scope of the present investigation [see Haynes (10), Wallbrown, Blaha, and

Wherry (22), and Wherry (27)]. However, the advantages of the Wherry-Wherry hierarchical factor solution can be summarized briefly. First, the solution provides an objective method for examining the structural relationships among ability dimensions. The investigator controls factorization through specifying minimum eigenvalues and maximum residuals for both primary and higher-order factors and/or indicating the number of primary factors to be extracted. Second, the solution maintains orthogonality among factors at all hierarchical levels, which means that variable variance can be readily partitioned among factors regardless of their position in the ability hierarchy. The relative importance of all factors can then be determined from this variance partition. Third, the solution eliminates the interpretational problems which are necessarily involved in working with inferred higher-order factors from oblique solutions.

B. METHOD

1. Subjects

Intercorrelations among WISC and ITPA subtests were obtained for 110 Ss referred to the Reading Clinic of the Columbus, Ohio, Public Schools for psycho-educational diagnosis. Full scale WISC IQs for the sample ranged from 75 through 125 with a mean of 101.13 and an *SD* of 12.80. Chronological age ranged from 8-0 through 10-0, and the mean *CA* in months was 110.62. The diagnosis of reading disability was based upon the following information which was available for each S: (a) developmental history, (b) medical history, (c) school report, (d) psychological evaluation, and (e) educational evaluation. For all Ss there was a discrepancy of at least two years between standardized reading test scores and learning expectancy level determined from WISC *MA* scores.

Learning expectancy level was computed by subtracting 5-3 from *MA* and converting the obtained grade score to decimal form, making it comparable to the grade-equivalent scores from the reading test.

All Ss with emotional disturbance, neurological impairment, impaired vision, impaired hearing or any other form of physical handicap were excluded from the sample on the basis of information in the medical and developmental history.

For each S scores were available for 12 WISC subtests and 10 ITPA subtests. Scores were not available for the Verbal Expression and Manual Expression subtests of the ITPA, since these are not part of the diagnostic battery employed by clinic personnel.

2. Data Analysis

A Wherry-Wherry (28) hierarchical factor solution was obtained on inter-correlations among standard scores for the WISC and ITPA subtests. At the primary level factorization was controlled by specifying a minimum eigenvalue of .30 and a maximum residual value equal to $1/\sqrt{N}$. Higher-order factorization was controlled by specifying a minimum eigenvalue of .20 and a maximum residual value equal to $1/2\sqrt{N}$.

Table 1 contains the distribution of residuals obtained from the hierarchical factor solution.

TABLE 1
DISTRIBUTION OF RESIDUALS

Interval	Frequency
.068 to .094	
.041 to .067	2
.014 to .040	27
-.013 to .013	47
-.040 to -.014	79
-.067 to -.041	50
-.094 to -.068	22
	4

A supplementary analysis was preformed to obtain reliability estimates for the reading disabled Ss of the present study. The split-half method (9, pp. 339-340) was employed to obtain reliability estimates for all 10 ITPA subtests and all WISC subtests except Digit Span and Coding. Odd-even correlations could not be computed for these two subtests. Consequently, reliability estimates for these subtests were obtained through a test-retest procedure for 40 Ss selected randomly from the total sample.

C. RESULTS AND DISCUSSION

Examination of the configuration of variables loading the *g*-factor summarized in Table 2 suggests that it can be equated with the construct general intelligence (*g*) initially formulated by Spearman (18). This interpretation is indicated by the position of the factor within the ability hierarchy, as well as the overall pattern of positive loadings from WISC and ITPA subtests. Interpretations of *g* vary considerably, but it has long been operationally defined as the pervasive overlap among diverse intelligence assessors.

Inspection of the array of variable loadings on the *g*-factor provides considerable information relevant to the clinical use of the WISC and ITPA with reading disabled Ss. First, the *g*-factor is not particularly strong, but it is defined distinctly. The mean *g*-factor loading for the 22 WISC and ITPA

subtests was only .29, which means that about 9% of the total variance in the subtests can be attributed to *g*. Yet the distinctiveness of the factor is demonstrated by an overall pattern of substantial positive loadings from the 22 intelligence assessors. Second, the WISC and ITPA appear to be about equally effective for purposes of measuring *g*. The mean *g*-factor loading was .28 for the 12 WISC subtests and .31 for the 10 ITPA subtests. Third, the ITPA representational subtests measure *g* much more effectively than the automatic subtests. The mean *g*-factor loading was .43 for the former but only .24 for the latter. Fourth, the WISC verbal and performance subtests seem to measure *g* with an equal degree of accuracy as indicated by a mean loading of .28 for both. Fifth, the four representational subtests of the ITPA constitute the most effective single class of *g*-assessors among the 22 subtests considered. Sixth, the Auditory Association subtest of the ITPA measures *g* more effectively than any of the other variables included in the study.

The predominance of Auditory Association among the *g*-assessors is not difficult to interpret and rationalize, since this subtest consists of verbal analogies. In the terminology of Spearman (19) verbal analogies require the education of a relationship between two words and the education of a correlated word or fundament from another word and the relationship between the first word pair. According to Spearman (19), tests that require the education of a relationship and/or correlate constitute the best measure of *g*. Since the Auditory Association subtest requires both processes, its importance as a *g*-assessor is quite understandable.

The pattern of variables loading Factor I and its position within the ability hierarchy suggests that it corresponds to the verbal-educational (*v:ed*) factor from Vernon's (20) hierarchical paradigm. According to this paradigm, *v:ed* is a major group factor directly below *g* in the ability hierarchy which reflects the influence of a relatively uniform educational system. The *v:ed*-factor includes the application of previously acquired verbal information and skills to the solution of new problems, as well as the information and skills themselves.

All verbal subtests from the WISC and ITPA loaded the *v:ed*-factor positively. The mean WISC verbal subtest loading was .26, and individual subtest loadings ranged from .22 through .32. In contrast, the mean WISC performance subtest loading was —.07 which illustrates the distinctiveness of the *v:ed*-factor. The mean loading for the six ITPA auditory subtests was .37, and individual subtest loadings ranged from .22 through .49. Comparison of the factor loadings from WISC verbal and ITPA auditory subtests suggests a larger *v:ed* component for the latter.

In consideration of both the WISC and ITPA, the four most effective *v:ed*-assessors are Grammatic Closure, Auditory Association, Sound Blending, and Auditory Closure all of which are from the ITPA. The magnitude of the *v:ed* component in these four subtests suggests that they are influenced considerably by the cumulative effects of the educational curriculum.

Positive loadings on the *v:ed*-factor by Visual Reception and Visual Association seem to indicate that these two visual-representational subtests of the ITPA contain a moderate *v:ed* component.

Factor II is defined distinctly by an overall pattern of positive loadings from WISC performance subtests. The mean performance subtest loading was .41 with individual subtest loadings ranging from .21 through .54. The nature of the variables defining Factor II, as well as its position within the ability hierarchy, suggests that it can be equated with the spatial-perceptual-mechanical (*k:m*) factor of Vernon's hierarchical paradigm. According to Vernon, *k:m* is a major group factor directly below *g* and parallel to *v:ed* in the ability hierarchy. However, the content of the three subtests loading the *k:m*-factor most strongly suggests a preponderance of the spatial-perceptual (*k*) aspect of the factor.

Three of the four ITPA visual subtests loaded the *k:m*-factor to a noticeable degree. The two visual-automatic subtests, Visual Sequential Memory and Visual Closure, loaded substantially. However, loadings by the two visual-representational subtests were not comparable. The Visual Reception subtest loaded slightly, and the Visual Association subtest loaded negligibly.

The overall configuration of variables defining Factor 1 is not especially strong, but exclusive loadings from all six ITPA automatic subtests give the factor distinction and indicate that it may correspond to the automatic language parameter of the ITPA model (11). The mean loading for the six automatic subtests on Factor 1 was .28, and individual subtest loadings ranged from .22 through .37. Factor 1 was named automatic language (AL) on the basis of a distinct pattern of positive loadings by the automatic subtest.

Positive loadings from the Vocabulary, Similarities, and Information subtests of the WISC not only define Factor 2, but also suggest that it is differentiated from the broader *v:ed* factor. These three verbal WISC subtests all require the ability to describe precisely the essential characteristics of a word, relationship, or problem situation. Consequently, Factor 2 was named verbal precision (VP) for this common element. The nature of the VP-factor can be illustrated through Similarities where *S* earns 2 points for the defining relationship between two words but only 1 point for a nondefining but descriptive statement. Similar scoring standards apply to Vocabulary where the defining

feature of a word earns 2 points, but a major use or description earns 1 point. Only the first five items of the Comprehension subtest are scored in this manner, which explains the smaller loading for that subtest.

Strong positive loadings from the Digit Span and Arithmetic subtests of the WISC and the Auditory Sequential Memory subtest of the ITPA define Factor 3 and show that it is differentiated from the broader *v:ed*-factor. Furthermore, the loadings by Digit Span and Arithmetic strongly suggest congruence with the "freedom from distractibility" (FD) factor obtained by Cohen (5, 7, 8) in analyses of the W-B, WAIS, and WISC. Cohen (4, 5) first offered an FD interpretation for this factor but later rejected it in favor of a memory interpretation (6, 7). In a later analysis Cohen (8) reverted back to his original FD interpretation because of loadings by subtests not involving memory. Cohen (4) described the FD-factor in the following manner: "A conative factor which makes it possible for problem elements to 'register' and be maintained without loss in the course of manipulation, i.e., the ability to attend or concentrate" (p. 272).

Positive loadings from the Coding and Picture Arrangement subtests of the WISC and Visual Association and Visual Closure subtests of the ITPA define Factor 4 and suggest that it is differentiated from the broader *k:m* factor. The strong loading from Coding and the loading from Picture Arrangement suggest that Factor 4 may correspond to the "quasi-specific" (QS) factor obtained by Cohen (7, 8) in analyses of both the WAIS and WISC. Cohen's (8) factor name was maintained for purposes of continuity even though the present factor is loaded by a wider array of variables.

Positive loadings from all four ITPA representational subtests define Factor 5 and suggest that it corresponds to the representational language parameter of the ITPA model (11). However, negative loadings by two visual-automatic subtests, Visual Sequential Memory and Visual Closure, complicate interpretation of Factor 5 and suggest that it may be bipolar in nature. That is, Ss scoring high on the representational subtests tend to score lower on the Visual Sequential Memory and Visual Closure subtests, and *vice versa*. This bipolar tendency probably reflects a particular pattern of perceptual-cognitive dysfunction among reading disabled Ss included in the present study. Consequently, it seems reasonable to name Factor 5 representational language (RL) on the basis of the pattern of positive loadings by ITPA representational subtests.

The reliability estimates (r_{jjs}) reported in Table 2 indicate that for reading disabled Ss the ITPA subtests are substantially more reliable than those of the WISC. The mean reliability coefficient was .77 for the 10 ITPA subtests

but only .62 for the 12 WISC subtests. Reliabilities for the ITPA representational and automatic subtests were comparable, with a mean coefficient of .78 for the former and .77 for the latter. In contrast, the WISC verbal subtests are considerably more reliable than the performance subtests. The mean reliability coefficient was .68 for the former and .57 for the latter.

The proportion of specific variance (s) obtained for WISC subtests generally supports Cohen's (8) assertion that an interpretative rationale based upon individual subtests cannot be defended on the basis of factor analytic research. The mean proportion of subtest specific variance was .25 for the verbal subtests, but individual subtest specificities ranged from .06 through .44. The specificities for the Information and Comprehension subtests were .44 and .43, respectively, which, if cross-validated, might be large enough to justify individual interpretation for reading disabled Ss. The specificities for the performance subtests were all inconsequential, as indicated by a mean of .16 and a range from .04 through .23.

Subtest specificities were somewhat higher for the ITPA than for the WISC, which makes it more difficult to arrive at a clear statement concerning individual subtest interpretation which is basic to the ITPA model of Kirk, McCarthy, and Kirk (11). The mean specificity for the 10 ITPA subtests was .33, but individual specificities ranged from .20 through .48. It is difficult to state precisely the amount of specificity necessary for individual subtest interpretation. However, the specificities for the Auditory Association, Visual Association, and Visual Closure subtests are clearly inadequate to justify individual interpretation. The specificities for the Visual Reception, Visual Sequential Memory, Auditory Sequential Memory, and Grammatic Closure subtests are such that individual subtest interpretation is questionable. With cross-validation the specificities for the Auditory Reception, Auditory Closure, and Sound Blending subtests seem large enough to justify individual interpretation within the context of the ITPA model.

D. CONCLUSIONS

1. The present findings suggest that Vernon's (20) hierarchical paradigm constitutes a useful framework for interpreting WISC and ITPA results for reading disabled Ss. The higher-order factors hypothesized by the paradigm not only emerged, but they emerged in accordance with the specific arrangement indicated by the paradigm. The ability hierarchy included a general (g) factor and two subgeneral factors corresponding to $v:ed$ and $k:m$, as well as five primary factors.

2. The g -factor for the present study was defined distinctly by a pattern

of positive loadings from all 22 WISC and ITPA subtests, but it was not defined strongly, since it accounted for only 9% of the total variance in the subtests. This finding agrees with the results obtained by Wallbrown, Blaha, Wherry, and Counts (23) who, in an hierarchical analysis of the WISC, found a much weaker *g*-factor for reading disabled Ss than for normals.

3. The degree of bifurcation between WISC verbal and performance subtests provides conditional support for Wechsler's (24) decision to maintain separate verbal and performance IQs. The distinctiveness of the *v:ed*-factor indicated the involvement of a cognitive process other than *g* within the verbal subtests; the distinctiveness of the *k:m*-factor indicated the existence of a cognitive process other than *g* within the performance subtests.

4. Three primary factors were defined on the basis of loadings from WISC subtests. Congruence was readily established between two of these factors and the freedom from distractibility and quasi-specific factors obtained by Cohen (8) in his classic analysis of the WISC. The third primary seemed to involve precision in verbal expression.

5. The proportion of variance specific to the WISC subtests, generally speaking, was too small to justify placing emphasis on individual subtest interpretation for reading disabled Ss. The only possible exceptions were the Information and Comprehension subtests.

6. The most effective single *g*-assessor from the WISC and ITPA was clearly the ITPA Auditory Association subtest which, according to Spearman (19), requires the education of both relationships and correlates. The four ITPA representational subtests constituted the most effective set of *g*-assessors. The WISC verbal and performance subtests were about equally effective *g*-assessors, and the ITPA automatic subtests were the least effective *g*-assessors.

7. The configuration of WISC and ITPA subtests loading the *g*-factor suggests that the general linguistic factor obtained in earlier factor analyses of the ITPA constitutes nothing other than general intelligence (*g*). Strictly speaking, this finding cannot be generalized beyond reading disabled Ss as operationally defined in the present study. However, as outlined by Campbell and Fisk (3), researchers proposing a new dimension must accept the responsibility for demonstrating the discriminant validity of that dimension from *g*. The present findings contradict the discriminant validity of the construct general linguistic development and place an even greater burden on proof on its proponents.

8. Some evidence relevant to the evaluation of the ITPA model (11) for reading disabled Ss was obtained in the present study. First, the representa-

tional subtests loaded the *g*-factor more strongly than the automatic subtests, which might be interpreted to mean that the former subtests measure more abstract cognitive functions than the latter. Second, a primary factor defined exclusively by a modest but distinct pattern of positive loadings from the six automatic subtests provides some support for the automatic language parameter of the ITPA model. Third, another primary factor defined by positive loadings from the four representational subtests provides support for the representational parameter of the ITPA model. Fourth, the proportion of subtest specificity differed considerably among the 10 subtests, but for at least three—Auditory Association, Visual Association, and Visual Closure—the specificity was definitely too small to justify individual interpretation for reading disabled Ss.

9. All of the 10 ITPA subtests except Visual Sequential Memory, Auditory Sequential Memory, and Visual Closure showed at least a moderate *v:ed* component, which suggests that performance is influenced by verbal skills and information included in the school curriculum.

10. The bifurcation between ITPA verbal and visual subtests was maintained at the automatic level but did not hold up at the representational level. Both visual-representational subtests showed a *v:ed* component greater than their *k:m* component.

REFERENCES

1. BAUMEISTER, A., & BARTLETT, C. A comparison of the factor structure of normals and retardates on the WISC. *Amer. J. Ment. Defic.*, 1962, **66**, 641-646.
2. ———. Further factorial investigations of WISC performance of mental defectives. *Amer. J. Ment. Defic.*, 1962, **67**, 257-261.
3. CAMPBELL, D., & FISKE, D. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychol. Bull.*, 1959, **56**, 81-105.
4. COHEN, J. A factor-analytic based rationale for the Wechsler-Bellevue. *J. Consult. Psychol.*, 1952, **16**, 272-277.
5. ———. Factors underlying Wechsler-Bellevue performance of three neuropsychiatric groups. *J. Abn. & Soc. Psychol.*, 1952, **47**, 359-375.
6. ———. A factor-analytic based rationale for the Wechsler adult intelligence scale. *J. Consult. Psychol.*, 1957, **21**, 451-457.
7. ———. The factorial structure of the WAIS between early adulthood and old age. *J. Consult. Psychol.*, 1957, **21**, 283-290.
8. ———. The factor structure of the WISC at ages 7½, 10½, and 13½. *J. Consult. Psychol.*, 1959, **23**, 285-299.
9. GARRETT, H. E. *Statistics in Psychology and Education* (6th ed.). New York: McKay, 1966.
10. HAYNES, J. Hierarchical analysis of factors in cognition. *Amer. Educ. Res. J.*, 1970, **7**, 55-68.
11. KIRK, S., MCCARTHY, J., & KIRK, W. *Manual for the Illinois Test of Psycholinguistic Abilities*. Urbana: Univ. Illinois Press, 1968.

12. LEVENTHAL, D., & STEDMAN, D. A factor analytic study of the Illinois test of psycholinguistic abilities. *J. Clin. Psychol.*, 1970, **26**, 473-477.
13. MCCARTHY, J., & KIRK, S. Manual for the Illinois Test of Psycholinguistic Abilities. Urbana: Univ. Illinois Press, 1961.
14. MEYERS, C. What the ITPA measures: A synthesis of factor studies of the 1961 edition. *Educ. & Psychol. Meas.*, 1969, **29**, 867-876.
15. OSBORNE, R. Factorial composition of the Wechsler intelligence scale for children at the pre-school level. *Psychol. Rep.*, 1963, **13**, 443-448.
16. RYCKMAN, D., & WIEGERINK, R. The factors of the Illinois test of psycholinguistic abilities: A comparison of 18 factor analyses. *Except. Child.*, 1969, **36**, 107-113.
17. SILVERSTEIN, A. Variance components of the Illinois test of psycholinguistic abilities. *Percept. & Motor Skills*, 1967, **24**, 1315-1316.
18. SPEARMAN, C. General intelligence, objectively determined and measured. *Amer. J. Psychol.*, 1904, **15**, 201-293.
19. ———. *The Abilities of Man*. New York: Macmillan, 1927.
20. VERNON, P. E. *The Structure of Human Abilities*. New York: Wiley, 1950.
21. WALLBROWN, F., BLAHA, J., & WHERRY, R. J. The hierarchical factor structure of the Wechsler preschool and primary scale of intelligence. *J. Consult. & Clin. Psychol.*, 1973, **41**, 356-362.
22. ———. The hierarchical factor structure of the Wechsler adult intelligence scale. *Brit. J. Educ. Psychol.*, 1974, **44**, 47-56.
23. WALLBROWN, F., BLAHA, J., WHERRY, R. J., & COUNTS, D. An empirical test of Myklebust's cognitive structure hypothesis for 70 reading disabled children. *J. Consult. & Clin. Psychol.*, 1974, **42**, 211-218.
24. WECHSLER, D. Manual for the Wechsler Intelligence Scale for Children. New York: Psychol. Corp., 1949.
25. ———. Manual for the Wechsler Adult Intelligence Scale. New York: Psychol. Corp., 1955.
26. ———. Manual for the Wechsler Preschool and Primary Scale of Intelligence. New York: Psychol. Corp., 1967.
27. WHERRY, R. J. Hierarchical factor solutions without rotation. *Psychometrika*, 1959, **24**, 45-51.
28. WHERRY, R. J., & WHERRY, R. J., JR. WHEWH program. In R. J. Wherry (Ed.), *Psychology Department Computer Programs*. Columbus: Dept. Psychol., Ohio State Univ., 1969.

Area of Psychological Services
Columbus Public Schools
450 East Fulton Street
Columbus, Ohio 43215

PURPOSES AND PROCEDURES OF VALIDATION*¹

Marquette University

M. Y. QUERESHI

SUMMARY

Validation is defined as a general scientific procedure for investigating the nature of reality, encompassing all scientific disciplines, regardless of the utilitarian value of the information. When the process is employed in the context of a discipline such as psychology, certain subcategories emerge whose interrelations, if viewed in the light of possible or intended uses of the collected information, demonstrate the interdependence of a variety of validation procedures some of which have been viewed in the past as separate entities. A hierarchical representation of purposes and procedures is presented to facilitate an understanding of their interrelations and interdependence.

A. VALIDATION AS A GENERAL SCIENTIFIC PROBLEM

Since science is concerned with the description and conceptualization of reality, an important question may be raised regarding the goodness of veridicality of various descriptions and conceptualizations. For example, a physical chemist studying the chemical composition of a substance, say table salt, may arrive at the conclusion that the substance is a compound of two elements, sodium and chlorine. The validity of this observation depends on whether other chemists analyzing the same substance under the same conditions arrive at the same conclusion. Similarly, if the blood of a person is diagnosed by a medical technician to be group B, Rh positive, this diagnosis is considered valid if other qualified technicians, using the same instruments and procedures, arrive at the same diagnosis.

In physical sciences, the substance or event (with a few exceptions—e. g., the study of stellar objects) whose nature is being investigated is usually more easily manipulated than subject matter in behavioral sciences. Also, compared with behavioral sciences, the data of physical sciences lend themselves

* Received in the Editorial Office on July 1, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Publication costs for this article were paid by a grant from the Committee on Research, Graduate School, Marquette University.

more easily to certain powerful measurement operations. Finally, the conclusions regarding the nature of physical matter and phenomena are more readily accepted because they do not violate cultural norms as frequently as conclusions in the realm of social and behavioral sciences do. Although the foregoing points illustrate differences between the physical and behavioral sciences that make the process of validation in the latter more difficult, the essential nature of the scientific enterprise in both domains is the accurate determination and explanation of the nature of reality. Therefore, any description is veridical or valid to the degree to which it accurately represents the selected segment of reality which a scientist intends to map. The criterion of veridicality is the intersubjective—and sometimes intrasubjective, but across occasions—verification of the descriptions according to the commonly accepted tenets of the scientific method.

Since the foregoing view is intended to apply to all fields of scientific endeavor, some modifications in defining validity may be needed in order to incorporate concepts and techniques in vogue in certain disciplines. For example, in psychology the concern is to describe and systematize the behavior of organisms whether for purely investigatory purposes or for entirely utilitarian objectives. Thus, validity may be defined as the degree to which certain observations (personal impressions, test scores, or other measures) represent the past, present, or future behavior or behavior capabilities of an organism or a group of organisms under certain specified conditions. According to this view, a psychological test is neither valid nor invalid, but the observations or measurements that it may yield under certain conditions for one or more persons may be valid or invalid depending on how accurately they measure the intended behavior or behavior capabilities and their representativeness of the domain of behavior under consideration. Traditionally (7), most of the discussion concerning accuracy has been presented under the rubric of reliability, while representativeness has been equated with relevance. However, in the present context neither accuracy and reliability nor representativeness and relevance are treated as equivalent; there are conceptual differences between the components of these two pairs of concepts, although in some situations they may denote interchangeable functions. While differences between accuracy and reliability may be important in some contexts, here the concern is a distinction between representativeness and relevance.

B. REPRESENTATIVENESS OR RELEVANCE

Whether one prefers the term representativeness over relevance or *vice versa*, the inescapable question arises: What is something representative of

or what is it relevant to? One must, therefore, specify the domain of behavior which a test claims to represent. If the selected domain of behavior embodies a series of tasks comprising a job or some other practical situation, it is usually designated as criterion. Once a series of behaviors is labelled as criterion, then relevance may be defined (7, p. 625) as the correlation between the true test scores and the true criterion scores. On the other hand, if one is interested in a representative sampling of a domain of behavior, whether it is of theoretical nature or of practical import, there is little need for designating the selected behavior domain as criterion and even less need for defining the relevance of a test as the correlation between two sets of true scores. The problem of representativeness of behaviors sampled by a test cannot be solved by estimating the correlation between two sets of true scores; rather, it is to be resolved by means of determining the adequacy of the sampling procedures employed in selecting test behavior series from the domain of behavior which is of interest or concern. The difficulty, of course, arises when it is not possible to define and delineate adequately the domain of behavior to be mapped, as a result either of its inaccessibility or its vagueness under the conditions of available knowledge and technology.

The definition of the selected domain of behavior and the identification of its behavioral components must take into account the fact that the behavior does not occur in a vacuum. Any behavior at any level of complexity represents an action or reaction of an organism or a group of organisms under certain specified or specifiable spatiotemporal conditions. Thus, a representative behavior sample is an unbiased selection of the directly or indirectly observable actions or reactions of a representative group of organisms under representatively sampled spatiotemporal conditions. In those situations where the selected domain of behavior is neither directly accessible nor explicitly definable, one may resort to the alternative of observing or measuring behavior that is presumably related to the behavior of ultimate concern. Under these circumstances, attention may be focussed on the relevance of the behavior samples to the domain of behavior that one eventually wishes to map. Another important distinction between representativeness and relevance is that a representative sample of behavior is always relevant to the domain of interest, but a relevant behavior sample may or may not be representative of the criterion domain except in the rare case where the correlation between the true criterion scores is unity.

The foregoing discussion does not resolve the more basic problem of deciding what is important or crucial enough, either for science or for society or for both, to deserve the expenditure of scientific, technical, and other

resources. Within a particular sociopolitical system there are several hierarchies of priorities which compete with one another for national resources, and within a particular hierarchy there is further competition for the segment of the resources made available to all the hierarchical components. The relative importance of the various hierarchical systems, as well as that of the components within a hierarchy, depends on a number of continuously changing complexes of interacting social and physical forces. If one takes 1957, the year of the Sputnik, as the starting point and reviews the changes that have occurred in the national priorities and the funding of science and scientific research over the past 16 years, certain trends become strikingly clear. During the post-Sputnik quintennium, great emphasis was placed on funding science education and research from high school through the university level; aerospace research and technology received generous support; graduate education in fundamental as well as applied science was given high priority; research in basic and applied sciences was freely subsidized; and little concern was shown for such causes as pollution, population control, and poverty. However, the Vietnam War and social upheaval during the middle and late sixties set new forces in motion, and the nature and order of priorities by 1970 changed dramatically. A list of major problems of American society in 1970 would have included the need to terminate the Vietnam War and the search for a stable peace, dealing with political terrorism, ameliorating the plight of the inner city, formulating some progressive resolution of the racial tensions, understanding and coping with crime and violence, understanding the causes of the alienation of youth and the rise in drug usage, dealing with the population problem on both national and international levels, development of an adequate and equitable system of health care, and alleviation of physical and biological environmental problems. An inventory prepared today will include most of the aforementioned problems, but one may add some new ones such as procuring adequate energy resources, dealing with problems of transportation and traffic accidents, and the prevention of illegal, unethical, and corrupt practices in government and politics. The priority order of these problems will differ from individual to individual and from group to group, but many of them are such that basic biological and physical science could make only limited contributions to their solution. In the competition for national resources, therefore, fundamental science is likely to receive a less favorable treatment during the seventies than it did in the sixties.

Some of the views regarding the relative priority of various social and environmental problems that should merit the investment of time and money may be of momentary nature. For example, three years ago *The New York*

Times reported that pollution was "The Cause of the Year," but today the enthusiasm seems to have subsided considerably. If the nation has to turn to environmental problems, then higher priority should be given to traffic accidents, fighting hunger and malnutrition, and improving schools; while saving wildlife and constructing bigger and better disposal systems, although worthwhile, should not override other serious problems. Scientists have a responsibility in proving guidance in the ordering of priorities, and even continuing research at the risk of losing support, provided that such investigations are crucial to the long-term goals of science and society. One should not be swayed by fads in science education or science research, but the most difficult problem, of course, is to identify crucial problems from fads, an area in which, at least to my knowledge, no hard and fast rules seem to prevail.

Psychology or any other discipline cannot ignore the ordering of priorities in a society at any particular juncture in time. If an individual scientist, whether specializing in the physical, biological, or behavioral sciences, chooses a problem area which entices his curiosity, regardless of the demands of the social-psychological milieu, he does so at his own peril. Like Edison, he may eventually discover knowledge and devise instruments that may win him fame and fortune, or he may face misery and anonymity like many a gold-pro prospector who never hit the pay dirt. In general, however, the decision regarding the worthwhileness of a problem area must be made in the light of expert, intelligent, and well-balanced evaluation of the circumstances. The scientist usually has to arrive at a compromise between the urgings of his intellect and interests and the demands of the social milieu in regard to the priority system of various problem areas. Once a problem area (a segment of the psychosocial, physical, or biological reality) has been selected, the investigator must face and resolve the scientific and technical problems of describing and explaining the causes, processes, and outcomes involved therein.

C. PROBLEMS IN DEFINING AND MEASURING THE SELECTED BEHAVIOR DOMAIN

In the present context, a distinction has been made between criterion behavior and the selected behavior domain: the former refers to behavior required for successful performance in a practical setting, whereas the latter applies to any segment of behavior deemed worthy of investigation regardless of its practical relevance. In either case, before actually measuring any kind of behavior, one must clearly define a number of behavior parameters: (a) the function or aspect of behavior which must be measured; (b) the popula-

tion (adults, children, college students, factory workers, etc.) in which the function is to be studied; (c) the spatiotemporal circumstances under which the selected behavior takes place; and (d) the rules and instruments for observing and recording behavior. The function itself must be specified in terms of its component acts or operations, the materials employed, and the outcomes or products of the acts and operations *vis-à-vis* the other three behavioral parameters.

In the light of the foregoing discussion, it is reasonable to divide the domain of behavior into three area clusters: (a) those that have, at the given time, mainly practical or utilitarian value; (b) those that have, at the time of selection, chiefly scientific or theoretical import; and (c) those that possess both practical relevance and scientific importance. Although many of the methodological and technical problems cut across the aforementioned tri-chotomy, there are several differentiating aspects of those categories that necessitate a separate treatment of the problems of definition and measurement pertaining to each.

1. *Practical Criteria*

A selected domain of behavior may be of practical value and yet difficult to measure because of its inaccessibility. Also, the mere fact that the selected behavior is of practical relevance does not necessarily guarantee that the criterion is concrete and natural. For example, the function of a drivers' training program may be to provide a group of individuals, who meet certain physical prerequisites, knowledge and skills to operate an automobile under various natural conditions. The ultimate test of the goodness of the training program would be the performance of a group of drivers who were graduated from the program on the road under a variety of natural circumstances for a reasonable length of time after graduation. In this specific case the first problem is to decide whether one is going to use the safe operation of the vehicle (i. e., absence of traffic accidents) for the rest of the person's life—provided that he does not die in traffic accident—or for a certain number of years as the criterion, or whether we would rely on a more convenient way of measuring his knowledge and skill to operate a vehicle, such as reflected in his ability to pass the written and road tests of the State Motor Vehicle Department designed for the applicants for an operator's license. The former criterion is conceptually simple and behaviorally concrete, but to obtain the criterial data one must wait for many years, if not a whole lifetime. Since the trainee has to pass the state's test for licensed drivers anyway, a drivers' training school must first develop knowledge and skill in its students to pass

both the written and the road tests designed by the State's Motor Vehicle Department. Thus, one may designate the intermediate criterion as mastery of the traffic rules and regulations and recognition of traffic signs and symbols as embodied in a booklet published by the State Motor Vehicle Department, plus performing adequately all the maneuvers that constitute the road test. A more detailed description of the criterion situation in the present example may be as follows:

(a) Knowledge of the written material—as given in the booklet describing the state's traffic laws, rules and regulations regarding the operation of vehicles, highway signs and signals, and personal (social and physical) qualifications—is the first requirement. This knowledge should be accompanied by certain skills in the actual operation of the vehicle, consisting of such maneuvers as starting the vehicle, gradual and sudden stops, backing, parking, stopping on a hill, starting on a hill, turning about, posture, use of clutch (if required in the vehicle), use of horn, intersection speed, intersection observance, turning into and getting out of a lane, observance of traffic signs and signals, overtaking, being overtaken, following right-of-way observance, attention, control of speed, use of brakes, use of accelerator, and courtesy to other drivers.

(b) It is also essential to specify the physical and chronological characteristics of the individual whose knowledge and performance are going to be measured. In most states the age limit and the physical qualifications for an operator's license are a matter of public record. In practice, these matters are understood and the selection of trainees takes them into consideration, but they should be specified clearly in any analysis of the criterion behavior.

(c) The testing of a person for an operator's license may be conducted in a motor vehicle with standard shift or automatic control, under normal road conditions or on a rainy day during certain hours. In addition, the location where the test is going to take place needs to be specified, since in some cases this may be an important factor.

(d) The rules and instruments for observing and recording behavior in this specific example are rather unstandardized and subjective. The road test is given by a patrolman, employed by the Motor Vehicle Department, who makes judgments along the way as he directs the candidate to perform the necessary maneuvers. In another criterion situation (e. g., the production of certain parts in a manufacturing plant) the instruments for recording and observing may be mechanical and highly objective. Whatever the case, such specifications must be made in order to describe fully the criterion behavior. The foregoing example illustrates some of the problems that accompany

attempts at defining and measuring practical criteria. For convenience, one could accept the functions sampled by the written and road tests of the Motor Vehicle Department in one of the states in the U. S. as the criterion. A close examination of the various aspects of the criterion behavior indicates that it is neither completely realistic (e. g., actual driving occurs both night and day and not only between the hours of 8:00 A. M. and 5:00 P. M. when the road tests are always administered) nor very objective (e. g., scoring by one patrolman of various performances could be quite different from that of another one in the same examination center, let alone in another town in the state). The ultimate criterion, of course, is a safe and courteous driving record for most of the normal and active life of the individual, but the criterion behavior sampled by the Motor Vehicle Department's tests have seldom been shown to be substantially correlated with the ultimate criterion measures.

The foregoing discussion has presumed the existence of consensus regarding what constitutes criterion behavior when we are dealing with practical matters. Even when the criterion can be definitely concrete, it is difficult to demonstrate beyond reasonable doubt that one type of criterion measure is the best. If in a manufacturing plant the quantity of production per worker is taken as an acceptable criterion measure, there is no guarantee that a test which correlates substantially with this criterion will result in the selection of best workers, since such other aspects of performance as quality of production, job turnover, absenteeism, etc. may be equally crucial for the overall productivity of the company. The criterion or criteria, thus, should cover all of the important aspects of a job, and one cannot be satisfied with the most obvious aspects of measurable performance.

2. The Theoretical Domain

The dichotomy between theoretical and practical objectives as presented here is only a matter of convenience, since there is a continuous interaction going on between theory and practice, if not in the conceptualization of a single researcher, at least in the realm of social-scientific endeavor. However, for many researchers the distinction is often important enough, as well as feasible to maintain, so that problems encountered in defining and measuring practical criteria are not completely congruent with those encountered in the theoretical domain. Previous literature (2) has amassed all such discussion under the rubric of "construct validation," but as it can be seen, constructs themselves are the structural elements of a theory, and hence it is the validation of a theory that one should properly speak of rather than the validation

of a construct. Further discussion in this regard is presented in connection with the elaboration of validation procedures and strategies.

In spite of the controversy regarding the need for theories in psychology, the view presented here is based on the presumption that for one reason or another theories are useful in conceptualizing and in symbolically preserving the varieties of experimental and experiential data in science as well as in nonscientific disciplines. Although deductions from theories can be verified in a number of ways, sometimes it is convenient to design a psychological test or inventory that serves as a defining (as well as measuring) tool for the anchoring variable(s) in the deduction or inference. On the other hand, a psychological instrument may have been designed originally for a practical purpose, but may eventually become a means of validating a theory if it measures the behavior domain encompassed by the theory.

The chief problems in theoretical validation stem from three sources: (a) the developmental stage and the structural precision of the theory, (b) the meaningfulness of its concepts, and (c) the testability of the theory (i. e., whether the verification of deductions is feasible on logical and practical grounds). For illustrative purposes, one may take the hierarchical theory of human abilities presented by Burt (3) and Vernon (10). Vernon's organization and structure of human abilities place Spearman's *g* factor at the top, *s* factors at the bottom, and major and minor group factors of different degrees of generality in between the two extremes. The theory is an oversimplification of the structure and organization of human abilities and is based on the results of correlational analyses of batteries of tests administered to relatively large groups of subjects. The general factor, *g*, although labelled according to Spearman's choice, is interpreted by Vernon in accordance with Thomson's viewpoint (9). Although only three levels are recognized in the hierarchy, additional levels are not necessarily precluded by the present model. Burt has furnished the details about how the theory originated and its applicability to the area of human abilities, as well as to the fields of temperament and of anthropometric measurements. Subsequently, Eysenck (8) extended similar hierarchical arrangement to the description of personality characteristics in which he places three broad "types" (introversion, neurosis, and psychosis) at the top and specific stimulus-response bonds at the bottom.

At the present, the hierarchical view seems to be more convincing in the area of human abilities than in the field of personality structure and measurement. However, even in regard to human abilities, the model is neither sufficiently general nor adequately precise. For example, the multitrait-multimethod matrix of Campbell and Fiske (4) points out the inapplicability of

the model unless one collapses the methods and obtains a single score, representing all methods, for every trait. However, if one is interested in methods instead of traits, one could obtain a single score for each method by summing across all the traits and secure a second hierarchy which will represent only the methods. The theory is testable, but the precision and adequacy of the factor analytic techniques necessary for its investigation are open to question. Many psychologists justifiably question any factor analytic method as a proper means of hypothesis testing.

D. VALIDATION PROCEDURES AND STRATEGIES

It is apparent from the previous discussion that validation in the present context is seen as a program or set of procedures designed to determine the accuracy and representativeness of the descriptions of a certain segment of reality or behavior domain. Thus, validation of a particular description, or an inference or interpretation therefrom, is to be viewed in the context of a general scientific problem rather than as an adjunct of a specific procedure in psychological measurement. The purpose of an accurate description and analysis of human behavior is to provide a basis for the control and prediction of behavior in a variety of social-political-physical settings. Traditionally, however, psychological testing has been preoccupied with a much narrower view of validation, since psychological tests have been commonly employed to obtain data from which specific inferences can be made regarding the actual or potential behavior of an individual in a related or similar setting. Since a variety of inferences can be made from test data, a reasonable approach to the classification of validation procedures should be based on the feasibility of grouping inferences into various homogeneous clusters. The general definition of validation presented here should serve as the guiding principle for all validation procedures, but each subcategory of validation procedures is identified by either logically or empirically related inferences and interpretations.

It seems that a hierarchical representation of validation procedures shows the interrelations and relative primacy of various procedures more concisely than any other system of organization. The concern in psychology is the description, analysis, and systematization of behavior in as accurate and complete manner as possible. Validation, therefore, may be considered as a process of investigation providing a multiplicity of information (5). From such description, analysis, and systematization all types of inferences can be drawn about the past, present, or future behavior. The basic trunk subdivides into two branches depending on whether the inferences are made about be-

havior as sampled in a particular attempt or behavior as related to other behavior similarly or differently sampled. The first category is labelled here as theory-oriented validation. Figure 1 presents the inverted "validation tree" representing the variety of validation procedures and strategies, each one

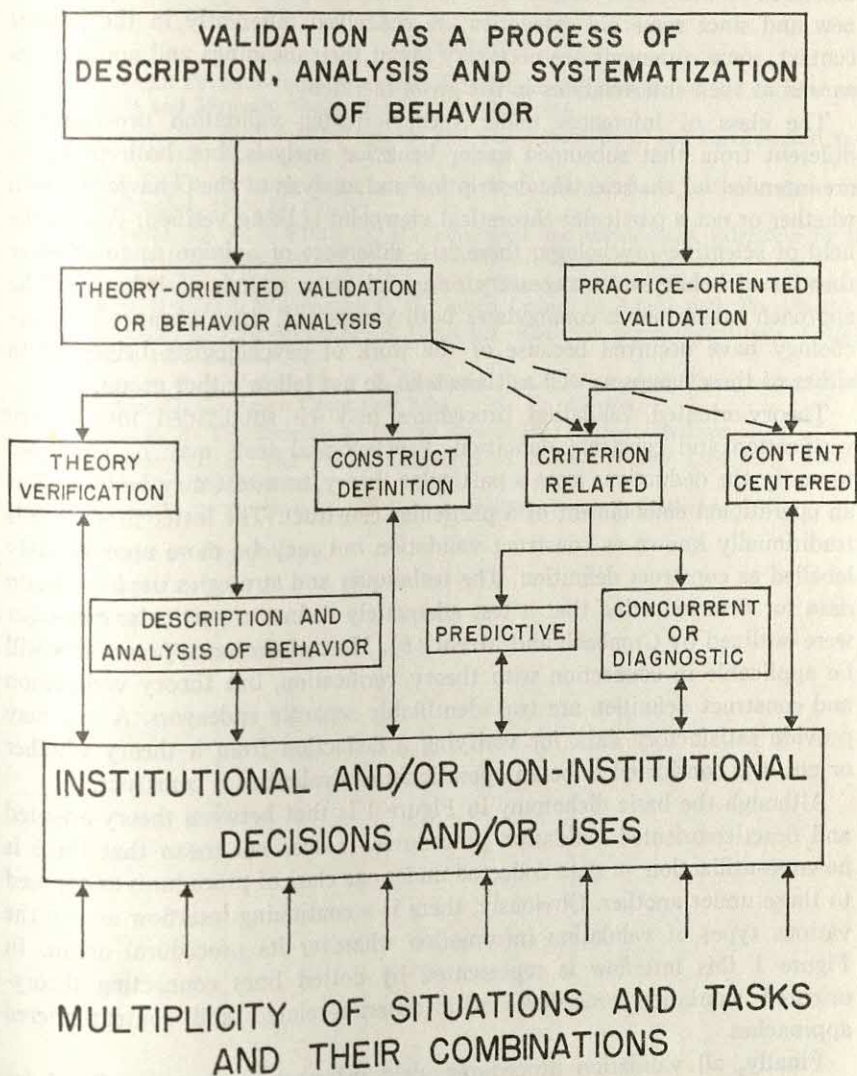


FIGURE 1

A HIERARCHICAL REPRESENTATION OF VALIDATION PURPOSES AND PROCEDURES

suggesting a way by which adequacy of the corresponding class of inferences can be determined.

No attempt is made here to describe and illustrate the variety of validation procedures presented in Figure 1, since most of them have been adequately described in other sources (1, 2). However, since some of the categories are new and since some old categories are conceived differently in the present context, some comments are necessary about their meanings and applications as well as their interrelations in the given hierarchy.

The class of inferences under theory-oriented validation procedure is different from that subsumed under behavior analysis, but both processes are intended for the scientific description and analysis of the behavior domain whether or not a particular theoretical viewpoint is being verified. Within the field of scientific psychology, there is a difference of opinion as to whether theories of behavior are necessary or useful for a science of behavior. The approach taken here accommodates both viewpoints, since advanced in psychology have occurred because of the work of psychologists belonging to either of these camps as well as those who do not follow either group.

Theory-oriented validation procedures may be subdivided into theory verification and construct definition. Psychological tests may be employed to verify the deductions from a particular theory, or a test may be treated as an operational embodiment of a particular construct. The latter procedure is traditionally known as construct validation but may be more appropriately labelled as construct definition. The techniques and strategies used to obtain data for demonstrating that a test adequately defines a particular construct were outlined by Cronbach and Meehl (6). Most of the same procedures will be applicable in connection with theory verification, but theory verification and construct definition are two identifiably separate endeavors. A test may provide satisfactory data for verifying a deduction from a theory whether or not it is considered to be an operational equivalent of a construct.

Although the basic dichotomy in Figure 1 is that between theory-oriented and practice-oriented validation procedures, it does not mean that there is no cross-utilization of data collected under one class of procedures as opposed to those under another. Obviously, there is a continuing interflow among the various types of validation information whatever its procedural origin. In Figure 1 this interflow is represented by dotted lines connecting theory-oriented validation procedures with criterion-related and content-entered approaches.

Finally, all validation procedures yield information that is utilized for making scientific and/or applied decisions by and for individuals, as well as

by and for institutions. The situations and tasks and their combinations to be investigated by means of these validation procedures are obviously numerous, and their degree of generality or specificity is a matter for the scientist to decide in the light of his knowledge, resources, and interests and the needs and demands of scientific and social circumstances.

REFERENCES

1. AMERICAN PSYCHOLOGICAL ASSOCIATION. Standards for Educational and Psychological Tests and Manuals. Washington, D. C.: APA, 1966.
2. ———. Standards for Development and Use of Educational and Psychological Tests (3rd draft). Washington, D. C.: APA, 1973.
3. BURT, C. The structure of the mind: A review of the results of factor analysis. *Brit. J. Psychol.*, 1949, **19**, 176-199.
4. CAMPBELL, D. T., & FISKE, D. W. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychol. Bull.*, 1959, **56**, 81-105.
5. CRONBACH, L. J. Test validation. In R. L. Thorndike (Ed.), *Educational Measurement* (2nd ed.). Washington, D. C.: Amer. Council on Educ., 1971. Pp. 443-507.
6. CRONBACH, L. J., & MEEHL, P. E. Construct validity in psychological tests. *Psychol. Bull.*, 1955, **52**, 281-302.
7. CURETON, E. E. Validity. In E. F. Lindquist (Ed.), *Educational Measurement*. Washington, D. C.: Amer. Council on Educ., 1951. Pp. 621-694.
8. EYSENCK, H. The Structure of Human Personality. London: Methuen, 1953.
9. THOMSON, G. H. The Factorial Analysis of Human Ability (3rd ed.). Boston: Houghton Mifflin, 1948.
10. VERNON, P. E. The Structure of Human Abilities. London: Methuen, 1950.

Department of Psychology
Marquette University
617 North 13 Street
Milwaukee, Wisconsin 53233

LOCUS OF CONTROL, STUDY HABITS AND ATTITUDES, AND COLLEGE ACADEMIC PERFORMANCE*

University of Manitoba

TERRY J. PROCIUK AND LAWRENCE J. BREEN

SUMMARY

This research examined the relationship between locus of control and two academic-related variables: study habits and attitudes, and college academic performance. Subjects were administered (a) the Brown-Holtzman Survey of Study Habits and Attitudes and (b) the Levenson Internal, Powerful Others, and Chance scales, the latter providing separate measures of two external control dimensions. Results indicated that internal control was related positively to effective study habits and attitudes and to college academic success, while the opposite was true for powerful others and chance control. Additional findings demonstrated significant differences between powerful others and chance control as related to study habits and attitudes and to college grade-point averages.

A. INTRODUCTION

Although previous research has failed to demonstrate a significant relationship between locus of control and college academic performance (2, 5), it appears a logical extension of the internal-external control construct that internals would be more successful academically than externals. Persons described as internals believe that reinforcements are contingent upon their own ability and effort. Externals, on the other hand, believe that reinforcements are controlled by external forces, such as powerful others, luck, chance, or fate. Consequently, internals would be expected to show more overt striving for achievement (6) and demonstrate greater academic success than externals.

In most research on internal-external control and college achievement, perceived locus of control has been considered a unidimensional, bipolar construct; i. e., an individual's generalized expectancy for reinforcement has been defined as internal or external. However, Hersch and Scheibe (3) have stated that this theoretical formulation may be too simplistic because of the

* Received in the Editorial Office on July 1, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

diversity in the meaning of external control. Similarly, Levenson (4) indicated that the definition of external control as an expectancy that fate, chance, or powerful others control reinforcements is too broad. Consistent with these observations, Levenson developed three scales—Internal, Powerful Others, and Chance—in order to measure belief in chance control separately from a powerful others belief. The rationale for differentiating external control into two dimensions stemmed from the reasoning that individuals who believe the world is unordered (chance) think and behave differently from individuals who believe the world is ordered but controlled by powerful others. In the second case the reinforcement source is more predictable, and a potential for personal control exists. Research employing these measures (4) demonstrated that individuals who scored high on the Chance scale showed less social action involvement and information seeking than high scorers on the Powerful Others scale. Such results thus suggest that, at least in some areas of experience, powerful others and chance orientations represent different beliefs and, therefore, should not be grouped together under the general heading of external control.

The purpose of the present investigation was to examine the relationship between locus of control and two academic-related variables, study habits and attitudes and college academic performance, by means of Levenson's three dimensions of internal-external control. Consistent with previous research (5) it was predicted that internal control would be related positively to effective study habits and attitudes and to college academic success, while both dimensions of external control—i. e., powerful others and chance—would be related negatively. It was further predicted that the chance dimension would show a stronger negative relationship with the two academic-related variables than would the powerful others dimension. This prediction was based on the reasoning that individuals who believe that reinforcements (course grades) are controlled by powerful others (e. g., professors) would consider this reinforcement source to be less capricious than luck or chance. Consequently, such persons would be expected to devote more effort to their college studies, and achieve a higher level of academic success than persons who perceive their course grades to be a function of chance, fate, or fortune.

B. METHOD

Subjects were 89 psychology students (33 males and 56 females) at the University of Manitoba, who participated voluntarily in this investigation. Each student's grade-point average (GPA), used as the measure of academic performance, was obtained from the University Registrar's Office.

The subjects were administered Levenson's (4) Internal (I), Powerful Others (P), and Chance (C) scales, and the Survey of Study Habits and Attitudes (SSHA) developed by Brown and Holtzman (1). Each of the I, P, and C scales consists of eight items in a six-point format (the items are administered as a unified attitude scale of 24 items). The scales include several items adopted from the Rotter I-E scale (6) and a set of statements written specifically for these new measures.

The SSHA is a 75-item questionnaire designed to identify differences in the study habits and attitudes of persons who obtain high *versus* low academic grades. The items are of two general types: those dealing with the mechanics and conditions of studying, and those concerned with attitudes toward studying and motivation to do well in academic work.

C. RESULTS AND DISCUSSION

Since the mean scores of all measures did not differ significantly for males *versus* females, the data were combined for subsequent analyses. Pearson product-moment correlations were calculated to examine the relationships among the variables of interest. Obtained correlations between the SSHA and the three locus of control measures were as follows: .47 ($p < .01$) for the I scale, $-.24$ ($p < .05$) for the P scale, and $-.40$ ($p < .01$) for the C scale. Correlation coefficients between GPA and the I, P, and C scales were .28 ($p < .01$), $-.09$, and $-.24$ ($p < .05$), respectively. These results support the prediction that persons who perceive reinforcements (i. e., course grades) as related directly to their own ability and effort would report more effective study habits and attitudes and achieve greater academic success than persons who believe that reinforcements are controlled by powerful others or by chance. Perceived internal control correlated positively with study habits and attitudes and with academic performance measures, while corresponding correlation coefficients with perceived powerful others or chance control were negative. This difference is obviously significant.

According to Rotter (6), external control is defined as a generalized expectancy that one's reinforcements are controlled by powerful others, chance, luck, or fate. Consequently, some degree of relationship was expected between the P and C scales, since both measure belief in controlling factors external to oneself. While the two scales correlated .68 ($p < .01$), further results indicated that these measures provide conceptually different indices of external control. Consistent with directional prediction, the correlation between SSHA and C scores ($r = -.40$) differed significantly ($t = 2.03$, $df =$

86, $p < .05$, one tail) from the correlation between SSHA and P scores ($r = -.24$). Therefore, externals who believe that their reinforcements are due to chance, luck, or fate report less effective study habits and attitudes than those who believe in powerful others control. Similarly, the correlation between GPA and C scores ($r = -.24$) was significantly different ($t = 1.80$, $df = 86$, $p < .05$, one tail) from the correlation between GPA and P scores ($r = -.09$). This finding indicates that persons who believe in chance control perform poorer academically than persons who perceive their reinforcements to be a function of powerful others.

In college academics, externals who believe that powerful others (e.g., professors) control reinforcements might feel that although their grades are not a direct result of their own behaviors, a potential for personal control exists. With increasing student participation in course planning, administrative policy decisions, grade appeals, etc., some personal control might be viewed as real. Consequently, such individuals would devote more effort to their academic work and achieve higher grade-point averages than chance externals, who do not perceive any potential for personal control.

Results of the present investigation support Levenson's differentiation of external control into powerful others and chance dimensions and provide a possible explanation for the lack of significant findings in earlier research on locus of control and academic achievement (2, 5). Previous research, employing the I-E scale, defined generalized expectancy for reinforcement as either internal or external; i.e., no distinction was made between belief in powerful others *versus* chance control. Therefore, in view of present findings, any potential grade-point average differences between internals and externals may have been attenuated as a result of the differential levels of academic performance of individuals who perceive reinforcements to be controlled by powerful others as opposed to chance, luck, or fate. Additional research is considered necessary to examine this possibility.

REFERENCES

1. BROWN, W. F., & HOLTZMAN, W. H. Survey of Study Habits and Attitudes Manual. New York: Psychol. Corp., 1956.
2. EISENMAN, R., & PLATT, J. J. Birth order and sex differences in academic achievement and internal-external control. *J. Gen. Psychol.*, 1968, **78**, 279-285.
3. HERSCH, P. D., & SCHEIBE, K. E. Reliability and validity of internal-external control as a personality dimension. *J. Consult. Psychol.*, 1967, **31**, 609-613.
4. LEVENSON, H. Distinctions within the concept of internal-external control: Development of a new scale. *Proc. 80th Ann. Conven. Amer. Psychol. Assoc.*, 1972, **7**, 261-262.

5. PROCIUK, T. J., & BREEN, L. J. Internal-external control, test anxiety and academic achievement: Additional data. *Psychol. Rep.*, 1973, **33**, 563-566.
6. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, **80**, Whole No. 609.

Department of Psychology

University of Manitoba

Winnipeg, Manitoba, Canada R3T 2N2

PERSONALITY CORRELATES OF ANAGRAM PROBLEM SOLVING*

Herbert H. Lehman College of the City University of New York

EDWARD I. GAVURIN AND DOROTHY MURGATROYD

SUMMARY

The relationship between personality and problem solving was studied by correlating anagram-solving performance with the 15 motivational traits measured by the Edwards Personal Preference Schedule. The results revealed a clear-cut pattern of relationships in which significant positive correlations were obtained between the socially oriented needs of Affiliation, Succorance, Nurturance, and Heterosexuality, while significant negative correlations were obtained for Deference, Intraception, and Endurance. The findings suggest that anagram solving is more sensitive to the socially oriented rather than the nonsocial needs of the solver, and that Endurance shows promise as a measure of problem-solving rigidity.

A. INTRODUCTION

The relationship between personality factors and problem-solving ability has been studied from time to time by investigators who have been concerned with different problem-solving tasks and with various measures of personality. In general, the attempt has been to demonstrate that certain personal characteristics and attitudes of the solver are associated with solution success. Thus, Luchin's water-jar rigidity has been related to ethnocentrism (4), the solution of anagrams and Mednick's Remote Associates Test for creative problem solving have been studied in relation to the *A* and *R* scales of the MMPI (5, 6), and anagram-solving performance has been correlated with Rotter's measure for locus of control (3, 8). Such diversity in the selection of problem-solving tasks and personality measures, however, provides relatively little information in the way of relating a wide range of personality traits to problem-solving ability. Consequently, a more systematic approach to the study of this relationship is necessary if more than a few isolated personal

* Received in the Editorial Office on July 5, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

characteristics are to be treated as factors relating to problem-solving behavior. The present study, therefore, undertook to provide this approach by employing anagram solving, a widely used problem-solving activity, in conjunction with the Edwards Personal Preference Schedule (EPPS), a well-researched, multifactor personality inventory. Hence, the investigation was devoted to an exploration of the relationship between one of the most frequently studied forms of problem-solving behavior and the generic personality traits originally suggested by Murray (7) and measured by the EPPS.

B. METHOD

1. Tests

a. Anagram test. A 60-item, five-letter anagram test was employed. It was administered by means of a three-page printed booklet which contained a top sheet for identifying information, a second page on which the anagrams were printed in lower-case letters, and a bottom sheet which contained numbers corresponding to each anagram on the preceding page with a space next to each number for writing in the answer. In this way, after the top sheet was permanently folded back at the beginning of the test, the question (problem) sheet always served to shield exposure of the answer sheet, except for the brief time it took subjects to record an answer.

Directions for the test were given to the subjects orally and included a description and an example of an anagram problem, along with instructions on how to use the test booklet.

b. Edwards Personal Preference Schedule. This personality inventory was selected because it provided a convenient means for measuring 15 basic motivational traits on a self-report basis, and because it was resistant to faked responses on the basis of social desirability. The traits that it measures are the following: Achievement, Deference, Order, Exhibition, Autonomy, Affiliation, Intraception, Succorance, Dominance, Abasement, Nurturance, Change, Endurance, Heterosexuality, and Aggression.

Edwards' manual (1) describes the administration and scoring procedure of the inventory.

2. Subjects and Procedure

The subjects were 83 male and 163 female students enrolled in psychology courses at Herbert H. Lehman College.

All subjects were tested in groups in their respective classrooms with the anagram test administered first, followed by the EPPS. In most cases, two separate sessions were required.

C. RESULTS AND DISCUSSION

As expected, no significant difference between the anagram-solving performance of men ($M = 21.83$, $SD = 14.35$) and women ($M = 19.92$, $SD = 11.78$) was observed ($t = 1.04$). The analyses that follow, therefore, were uncomplicated by the existence of any group differences in anagram-solving ability.

Table 1 presents Pearson correlations obtained between the scores on the

TABLE 1
PEARSON CORRELATIONS BETWEEN THE ANAGRAM TEST AND THE
EDWARDS PERSONAL PREFERENCE SCHEDULE (EPPS) VARIABLES

EPPS variable	Males ($N = 83$)	Females ($N = 163$)	Males and females ($N = 246$)
Achievement	.020	.129	.100
Deference	-.176	-.122	-.146*
Order	.017	-.062	-.042
Exhibition	.251*	-.030	.090
Autonomy	-.151	.044	-.015
Affiliation	.233*	.139	.153*
Intracception	-.166	-.117	-.136*
Succorance	.260**	.154*	.174**
Dominance	-.058	-.149	-.089
Abasement	-.043	-.055	-.063
Nurturance	.166	.210***	.174**
Change	-.135	-.016	-.073
Endurance	-.325***	-.065	-.163**
Heterosexuality	.234*	.126	.178**
Aggression	.003	-.099	-.047

* $p < .05$.

** $p < .02$.

*** $p < .01$.

anagram test and each scale on the EPPS for men, for women, and for the two groups combined. This table reveals that for the combined group of subjects, significant positive relationships were obtained for Affiliation, Succorance, Nurturance, and Heterosexuality, while significant negative correlations were obtained for Deference, Intracception, and Endurance. It is of interest to note that all of the variables positively related to anagram solving (Affiliation, Succorance, Nurturance, and Heterosexuality) concern socially oriented tendencies for a closer relationship to other people, and that the negatively correlated variables are either nonsocial in nature (Intracception and Endurance), or tend to reflect needs that favor social distance (Deference). A pattern similar to this also emerges for men where significantly positive r s were obtained for the socially oriented variables of Exhibition, Affiliation, Succorance,

and Heterosexuality, while the one significant negative correlation was obtained for the nonsocial trait of Endurance.

For women, however, although a pattern identical to that of men did not emerge, the significant positive correlations obtained for Succorance and Nurturance again serve to reflect the presence of socially oriented tendencies in the capable anagram solver. It should be noted, however, that with respect to those variables where significant correlations were obtained for the two groups combined, the directions of the coefficients for women were identical to those obtained for men.

Of special significance is the finding that anagram solving is negatively related to Endurance, which has been described by Edwards as follows:

To keep at a job until it is finished, to complete any job undertaken, to work hard at a task, to keep at a puzzle or problem until it is solved, to work at a single job before taking on others, to stay up late in order to get a job done, to put in long hours at work without distraction, to stick at a problem even though it may seem as if no progress is being made, to avoid being interrupted while at work (1, p. 11).

Since this description suggests that a high need in Endurance is associated with perseverance rather than flexibility, and since flexible, response-shifting behavior has been shown to be positively related to anagram solving (2), it seems to follow that a high score in Endurance should therefore be associated with a low score in anagram solving. The result that the two are, in fact, negatively correlated lends support to the conclusion that Endurance may have potential as a measure of problem-solving rigidity and as a predictor of anagram-solving success.

Curiously, the variable of Achievement which Edwards describes as follows was found not to be related to anagram solving:

To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be a recognized authority, to accomplish something of great significance, to do a difficult job well, to solve difficult problems and puzzles, to be able to do things better than others, to write a great novel or play (1, p. 11).

One explanation for this outcome is the possibility that the anagram task may not be perceived as either sufficiently important or difficult to motivate the performance of subjects with high scores in Achievement. This could be due to the game-like character of the anagram task, a factor that might also be responsible for its greater sensitivity to the socially oriented rather than the nonsocial needs of the solver.

D. CONCLUSIONS

The present study permits the conclusion that success in anagram solving is associated with a distinct pattern of motivational traits measured by the EPPS. This pattern consists of positive relationships obtained for socially oriented needs and negative relationships obtained for needs of a nonsocial nature. Of special importance is the fact that Endurance appears to act as a measure of problem-solving rigidity and may, therefore, be useful as a predictor of solution success in problems requiring a considerable amount of response variability. Finally, the fact that the findings of the present study are specific to anagram solving suggests the need for additional research with other problem-solving tasks.

REFERENCES

1. EDWARDS A. L. Manual for the Personal Preference Schedule. New York: Psychol. Corp., 1959.
2. GAVURIN, E. I. Relationship of anagram solving to measures of divergent-production and letter-rearrangement ability. *J. Gen. Psychol.*, 1975, in press.
3. GAVURIN, E. I., & MURGATROYD, D. Anagram solving and locus of control. *Psychol. Rep.*, 1973, **33**, 402.
4. LEVITT, E. E. The water-jar Einstellung test as a measure of rigidity. *Psychol. Bull.*, 1956, **51**, 347-370.
5. MENDELSON, G. A., & GALL, M. D. Personality variables and the effectiveness of techniques to facilitate creative problem solving. *J. Personal. & Soc. Psychol.*, 1970, **16**, 346-351.
6. MENDELSON, G. A., GRISWOLD, B. B., & ANDERSON, M. L. Individual differences in anagram-solving ability. *Psychol. Rep.*, 1966, **19**, 799-809.
7. MURRAY, H. A. Explorations in Personality. New York: Oxford Univ. Press, 1953.
8. PETZEL, T. P., & GYNTH, M. D. Effects of internal-external locus of control and skill or chance instructional sets on task performance. *J. Gen. Psychol.*, 1970, **82**, 87-93.

Department of Psychology
Herbert H. Lehman College of the
City University of New York
Bronx, New York 10468

PERSONALITY, THE SOCIOCULTURAL ENVIRONMENT,
AND STUDENT POLITICAL ACTIVISM: TOWARD A
FIELD THEORY OF SOCIAL BEHAVIOR*¹

University of Colorado

STEPHEN I. ABRAMOWITZ²

SUMMARY

The suitability of a field-theoretical, social psychological model for understanding student political activism was assessed. Undergraduates provided information on their political involvements and also on certain personality dispositions and social environments implicated, in the theoretical literature, as conducing to them. Both the individual difference and the sociocultural predictor constellations explained an appreciable amount of variation in the political activity criteria. Evidence was then adduced to support the field-theoretical position that personality and social environment variables account for supplementary rather than overlapping segments of the variation in campus unrest. The results call into question the appropriateness of unidimensional or unidisciplinary approaches to understanding the activism phenomenon and suggest the likely futility of intervention programs based on them. They reinforce previous findings consistent with a field-theoretical explanation of complex social behavior.

A. INTRODUCTION

It has been observed that early stages in the growth of a body of knowledge are characterized by incomplete conceptualization. As data become available to reveal this insufficiency, a gradual shift toward increased theoretical sophistication usually occurs (4).³ As an example, some years ago univariate explanations of such complex social problems as alcohol and drug use were

* Received in the Editorial Office on July 8, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This report is based on a paper presented at the meeting of the Rocky Mountain Psychological Association, Salt Lake City, Utah, May 1970.

² Requests for reprints should be sent to the author at the address shown at the end of this article.

³ This process can be retarded, however, by inefficiencies introduced by experimenter bias (18) and other systematic errors of social scientists (4, 25).

common (e. g., 28). More recent formulations, however, acknowledge the probable multiple origins of those behaviors (without necessarily discounting the partial validity of earlier positions). One current multivariate system which has been advanced to explain alcohol and drug use locates the likely determinants in both the sociocultural and psychological spheres (e. g., 9, 10, 20, 21).

By contrast, the literature on student political activism has tended to remain confined within the conceptual boundary traditional to one or the other discipline. There are several reasons for this relative lack of development; for one thing, the widely scattered nature of the literature presents a formidable obstacle to would-be integrators. Perhaps a more serious impediment has its roots in the scarcely concealed ego-involvement of certain contributors. Investigators have tended to interpret data loosely and probably in a direction that casts their own political convictions in a favorable light. Thus, the reader of this literature is soon acquainted with its fragmentation, its stridency, and its indifference to the usual scientific precautions [for documentation of this assertion, see Abramowitz (1), Kerpelman (13), and Nikelly (16)]. The goal of the present study was to test the utility of a conceptual framework within which student political activism is regarded as the behavioral outcome of multiple personal and sociocultural factors operating simultaneously on the individual. The articulation of the schema draws heavily from the work of Jessor and his associates (9), which was directed toward the construction of a social psychology of drinking and of other complex social behaviors.

A field-theoretical orientation toward understanding human behavior considers personality and the environment as supplementary predictive systems (29). It thus enables the observer of student activism to construe protest-oriented behavior as determined by certain dispositions of the actor, as well as by certain features of his social and cultural environment. Viewed from this perspective, individual differences in activist proclivities would be expected on the basis of variation along certain dimensions of personality. Group differences in activism rates could be explained in terms of variation across certain sociocultural environments. The field-theoretical position thereby avoids certain embarrassments to which the exclusively personality and the exclusively sociological models are prone. The former cannot logically account for such well-documented features of the activism phenomenon as differential regional, school, and religious group levels of protest. A complementary line of reasoning prompts the conclusion that the solely sociological system is inadequate to explain differences in militant commitment among persons currently exposed to similar environments.

To provide feedback regarding the usefulness of the field-theoretical approach to understanding student political behavior, four personality and four sociocultural variables believed to be likely sources of variation in it (5, 11, 12, 14, 15, 26) were selected to represent their respective predictive domains. The four personality variables chosen for study were (a) value for humanistic expression, (b) attitude toward deviance, (c) belief in one's capacity to influence others, and (d) value for conventional competence-recognition. It was hypothesized that greater value for humanistic expression, greater tolerance of deviance, stronger belief in one's ability to have an impact on others, and lesser value for conventional competence-recognition would predict a higher degree of involvement in student political activity.

The four sociocultural variables selected were (a) exposure to activist role models, (b) exposure to encouragement for activism, (c) liberalism-fundamentalism of religious membership group, and (d) liberalism of major course area. It was anticipated that greater political commitment would be predicted by greater exposure to persons themselves engaged in activist-oriented behavior, by greater contact with persons who espouse ideologies supportive of such behavior, by membership in less fundamentalist religious denominations, and by greater exposure to relatively progressive or untraditional ideas in coursework.

Empirical confirmation of either set of hypotheses would, however, merely reaffirm the already established notion that a certain proportion of the variation in activism can be explained by using either personality or sociocultural variables. It would remain to test the field-theoretical proposition that the predictive power of an explanatory network is enhanced by combining personality and sociocultural concepts. To do so, data must first be presented to indicate that the variation accounted for by each of the two configurations of predictors is not redundant. In other words, evidence needs to be marshalled to demonstrate that variation within the constellation of personality predictors is linked to variation in activism with the measures of the sociocultural system held constant, and *vice versa*. Once this is shown, it then becomes logical to evaluate the usefulness of merging the two predictive systems into a broader theoretical network.

B. METHOD

1. Subjects and Procedure

The 38 male and 57 female Ss were undergraduates drawn from the introductory psychology pool at a large state university in the Rocky Mountain region. The data collection was carried out in small group testings undertaken

in the Fall of 1969. Respondents received experimental credit for their participation.

2. Instruments

The questionnaire completed by the Ss contained measures of commitment to political action and of the selected personality and sociocultural variables.

a. Political involvement criteria. Two indexes of the dependent variable were obtained. An activism report checklist constructed by the investigator gauged the extent of S's participation in behaviors aimed at the reform of certain social, political, or economic practices endorsed by culturally legitimated agencies. A typical item dealt with taking part in a demonstration or protest against school administration policies. Following Jessor, Graves, Hanson, and Jessor (9), another scale was devised to determine the degree to which the student had encountered negative consequences from his political actions. A representative question had to do with getting into trouble with one's family. Respective alpha coefficients were .83 and .74.

b. Personality predictors. Each of the four inventories was made up of Likert-type items, counterbalanced to control agreement set. The questions comprising the value for humanistic expression measure were adapted from Scott (22) or written by the author and tapped preference for independence, intimacy, creativity, intellectualism, and compassion. The similarly derived conventional competence-recognition items assessed the priority given to academic achievement, physical grace, material comfort, social skills, and social status. The interpersonal influence device measured the degree to which S believed himself capable of leading others or of having an impact on their style of life. Responses to the attitude toward deviance items reflected the extent to which violations of social norms were condoned. The latter two scales were written by the investigator. Reliability estimates for the four personality instruments were .56, .80, .76, and .67, respectively.

c. Sociocultural predictors. Two Likert-type multiple-item indexes and two single-item indexes were used to tap the four focal dimensions from the sociocultural network. Exposure to activist role models referred to the extent of S's opportunity to observe activism and its functional consequences in his immediate environment. The degree to which the student thought that as justified social agents in his environment approved of activism or viewed it as justified was gauged by the exposure to encouragement for activism questions. An instrument designed to measure perceived social support for marijuana use among college students (19) provided the conceptual basis for both sets of items. Religious group fundamentalism was operationalized on the

basis of clergymen's five-point ratings (24) of the strength with which the different religious denominations tend to proscribe members' nonnormative behavior. A respondent was also classified along a three-point continuum according to his amount of exposure to progressive or untraditional ideas through his major area courses. This determination was made by the investigator, prior to the scoring of the other items. The social support for activism scales generated alpha coefficients of .39 and .51, respectively. Interrater agreement on the one-item indexes was not assessed.

C. RESULTS AND DISCUSSION

Initial analysis disclosed that the data were consistent with the single variable hypotheses. In each of the 16 possible cases, the predictor variable related to activism in the expected direction (12 of the 16 Pearson correlations were significant at the .05, one-tailed level). The correlations ranged in magnitude from .09 to .59 (mean $r = .25$). Interpersonal influence was the only predictor that was not associated significantly with either behavioral criterion.

The bivariate correlations are thus consonant with previous results indicating that politically active youths are more likely than their peers to have an aesthetic-humanistic rather than a conventional-extrinsic value orientation and are less likely to proscribe nonconforming behavior (e. g., 2, 3, 6, 12). These data are also congruent with those earlier reports in which activists were depicted as behaving in accordance with, and not in opposition to, the expectations of significant others in their social environment (e. g., 6, 7, 12, 23, 27). However, the lack of relationship between interpersonal influence and political involvement challenges the idea that the campus protester is characterized by a sense of "specialness" that raises his belief in his ability to persuade others (12, 26). This conjecture might still be found valid among political activists more extreme than those in the present sample.

No single predictor variable was able to explain more than about 30% of the variation in political action. Although correction for measurement imprecision could have raised that figure somewhat, this outcome justifies consideration of a broader field-theoretical model. To accomplish this, S's scores on each predictor were split at the median. Groups of Ss were then constituted in terms of their high or low activism-prone position on the four personality predictors. Thus, a group of Ss high activism-prone on three or four of the four personality measures was constituted. In a similar fashion, a group was made up of students high activism-prone on any two of the four personality predictors, and a third group was composed of individuals high activism-

prone on none or one of the personality variables. The same procedure was followed with respect to scores obtained on the four sociocultural variables. Thus, for both the personality and the sociocultural predictor systems, three groups of Ss, theoretically characterized by low, moderate, or high activism-proneness, were constituted. Scores on the activism and on the problem-related consequences measure were also split at the median.⁴

The results are discussed as they pertain to the following questions: (a) the predictive efficacy of the personality and of the sociocultural system; (b) the extent to which each system *supplements* the predictive power of the other; and finally (c) the simultaneous predictive efficacy of the personality and the sociocultural systems considered *jointly*.

The data shown in Table 1 bear upon the expectation that the more theoretically protest-prone was a student's personality or sociocultural profile, the more activism in which he would engage and the more problem-related sequels he would experience. As can be seen from examination of the table, a student's relative position on the two behavioral criteria was related to his activism-potential profile. Further, this finding held for both the personality and the sociocultural predictors, as well as for both behavioral measures. Thus, the notion that either personality or sociocultural variables can be useful in explaining variation in student activism was reaffirmed.

These data, however, do not illuminate the issue of the relative redundancy or supplemental nature of the personality and sociocultural spheres. The question is essentially this: Does it matter within which domain the observer of student activism decides to work? If the sectors of variation accounted for by these two classes of variables are for the most part overlapping, then it would not matter. If, however, the systems account for *different* sectors of the variation in activism, then the researcher can increase his understanding by considering both systems simultaneously.

The data in Table 2 are relevant to this issue. They suggest that *when either class of predictors is controlled, the other accounts for an appreciable amount of variation in actual behavior*. The central point of the field-theoretical position thus received substantiation: the personality and the sociocultural variables in this study were *supplementary*, not redundant, classes of predictors. This outcome implies that the investigator who neglects either domain is

⁴ Alternative procedures for testing the notion of the joint influence of psychological and sociocultural variables on activism were, of course, available. Probably the most well-known of these is multivariate analysis, which takes into account the differential contribution of predictors. The pattern analysis operation (9) outlined above was employed, however, to facilitate presentation of the data.

TABLE 1
PERSONALITY, SOCIOCULTURAL, AND FIELD-THEORETICAL PATTERNS AND ACTIVISM

Predictor pattern ^a	N	Behavioral measures ^b	
		Activism (%)	Problem-consequences (%)
Personality			
Protest-prone 0 or 1 of 4	29	41 ^c	7 ^d
Protest-prone 2 of 4	38	61	24
Protest-prone 3 or 4 of 4	28	79	57
Sociocultural			
Protest-prone 0 or 1 of 4	43	44 ^e	12 ^f
Protest-prone 2 of 4	25	68	32
Protest-prone 3 or 4 of 4	27	78	52
Field-theoretical			
Protest-prone 0 or 1 of 8	9	22 ^g	0 ^h
Protest-prone 2 or 3 of 8	35	46	11
Protest-prone 4 of 8	20	70	30
Protest-prone 5 or 6 of 8	20	75	40
Protest-prone 7 or 8 of 8	11	91	82

^a Personality variables used: value for humanistic expression, value for conventional competence-recognition, interpersonal influence, and attitude toward deviance. Sociocultural variables used: exposure to activist role models, exposure to encouragement for activism, fundamentalism of religious membership group, and liberalism of major course area.

^b Percent above cutting point given for each criterion. Baseline of 60% of respondents above cutting point on activism; baseline of 28.4% above cutting point for problem-related consequences of activism.

^c $\chi^2 = 8.20$, $df = 2$, $p < .02$.

^d $\chi^2 = 18.16$, $df = 2$, $p < .001$.

^e $\chi^2 = 8.69$, $df = 2$, $p < .02$.

^f $\chi^2 = 13.30$, $df = 2$, $p < .01$.

^g $\chi^2 = 15.42$, $df = 4$, $p < .01$.

^h $\chi^2 = 24.90$, $df = 4$, $p < .001$.

restricting the amount of variation in student political behavior that his concepts are able to explain.

Demonstration of the interdependence of the personality and sociocultural domains warrants consideration of the joint contribution of the two classes of variables to the understanding of activism. In accordance with field-theoretical notions, it would be expected that prediction of activism from both classes of variables treated simultaneously has greater explanatory usefulness than does prediction for either domain alone. The data exhibited in the field-theoretical rows of Table 1⁵ are pertinent to this question. Examination of the table indicates that substantial improvement in prediction efficiency was

⁵ The reader will notice that five rather than three groups were constituted on the basis of respondents' activism-proneness on the eight personality and sociocultural variables used.

TABLE 2
FIELD-THEORETICAL PATTERNS AND ACTIVISM: CONTROLLING PERSONALITY
AND SOCIOCULTURAL VARIATION

Protest-proneness predictor pattern	N	Activism (%)	Problem-consequences (%)
<i>Controlling personality variation</i>			
0 or 1 of 4 personality variables	28	43	7
0 or 1 of 4 sociocultural variables	19	37	0
2 of 4 sociocultural variables	7	57	29
3 or 4 of 4 sociocultural variables	2	50	0
2 of 4 personality variables	39	59	23
0 or 1 of 4 sociocultural variables	15	47	13
2 of 4 sociocultural variables	13	63	23
3 or 4 of 4 sociocultural variables	11	73	36
3 or 4 of 4 personality variables	28	79	57
0 or 1 of 4 sociocultural variables	8	63	38
2 of 4 sociocultural variables	6	83	50
3 or 4 of 4 sociocultural variables	14	86	71
<i>Controlling sociocultural variation</i>			
0 or 1 of 4 sociocultural variables	42	45	12
0 or 1 of 4 personality variables	19	37	0
2 of 4 personality variables	15	47	13
3 or 4 of 4 personality variables	8	63	38
2 of 4 sociocultural variables	26	65	35
0 or 1 of 4 personality variables	7	57	29
2 of 4 personality variables	13	63	23
3 or 4 of 4 personality variables	6	83	50
3 or 4 of 4 sociocultural variables	27	78	52
0 or 1 of 4 personality variables	2	50	0
2 of 4 personality variables	11	73	36
3 or 4 of 4 personality variables	14	86	71

Note: For personality and sociocultural variables used, see Table 1. At each level of personality (sociocultural) protest-proneness, increasing sociocultural (personality) pressure toward the criterion was expected to result in successively higher proportions of individuals above the cutting point. Because the probability of this specified sequence occurring by chance was only .17, the binomial probability of its obtaining at as many as two of the three levels was .07 and at all three levels was .005.

achieved by considering the personality and the sociocultural variables simultaneously. The improvement in prediction over considering each class of variables separately (see upper rows of table) supports the field-theoretical notion that personality and environmental variables contribute independently to variation in student activism.

Certain constraints on the present research should be kept in mind. These include the well-known limitations of self-report data (17) and the single-campus focus. In addition, it is likely that relatively few militant activists were included among a sample drawn from the regular psychology pool, thus restricting the generalizability of the findings to groups of highly committed student protesters. However, that the predictors were able to account for

appreciable variation in political participation despite the possibly blunted range of criterion scores attests to the potency of the broad social psychological framework within which student activism was embedded. Because the study was cross-sectional, the results are equivocal with respect to primary direction of effect. However, longitudinal data suggest that college student marijuana use can be anticipated by differences in certain personality characteristics and by differential exposure to relevant social situations (8, 20, 21). Future research into campus ferment might likewise be directed toward demonstrating more conclusively that the personality and sociocultural variables in the field-theoretical schema do in fact tend to antecede rather than to follow political action.

The above cautions notwithstanding, the outcome of this investigation indicates that student activism can be understood effectively from a broad-gauge social psychological perspective. It thereby calls into question the ultimate utility of unidimensional or unidisciplinary models of collective expressions of student disgruntlement and of prevention, intervention, or promotion strategies based on them. In addition, its convergence with previous efforts to explain complex social behavior as a joint function of individual difference and environmental variables enhances the status of the field-theoretical viewpoint.

REFERENCES

1. ABRAMOWITZ, S. I. The comparative competence-adjustment of student left social-political activists. *J. Personal.*, 1973, **41**, 244-260.
2. ASTIN, A. Determinants of student activism. In J. Foster & D. Long (Eds.), *Protest: Student Activism in America*. New York: Morrow, 1970.
3. BAIRD, L. L. Who protests: A study of student activists. In J. Foster & D. Long (Eds.), *Protest: Student Activism in America*. New York: Morrow, 1970.
4. CAMPBELL, D. T. Systematic errors to be expected of the social scientist on the basis of a general psychology of cognitive bias. In R. Rosenthal (Chm.), *The Problem of Experimenter Bias*. Symposium presented at the meeting of the American Psychological Association, Cincinnati, September, 1959.
5. FISHMAN, J. R., & SOLOMON, F. Youth and social action: An introduction. *J. Soc. Issues*, 1964, **20**, 1-28.
6. FLACKS, R. The liberated generation: An exploration of the roots of student protest. *J. Soc. Issues*, 1967, **23**, 52-75.
7. FOSTER, J., & LONG, D. The dynamics of institutional response. In J. Foster & D. Long (Eds.), *Protest: Student Activism in America*. New York: Morrow, 1970.
8. JESSOR, R., JESSOR, S., & FINNEY, J. A social psychology of marijuana use: Longitudinal studies of high school and college youth. *J. Personal. & Soc. Psychol.*, 1973, **26**, 1-15.
9. JESSOR, R., GRAVES, T., HANSON, R., & JESSOR, S. *Society, Personality and Deviant Behavior: A Study of a Tri-Ethnic Community*. New York: Holt, Rinehart & Winston, 1968.
10. JESSOR, R., YOUNG, H. B., YOUNG, E. B., & TESI, G. Perceived opportunity, alienation,

- and drinking behavior among Italian and American youth. *J. Personal. & Soc. Psychol.*, 1970, **15**, 215-222.
11. KENISTON, K. The sources of student dissent. *J. Soc. Issues*, 1967, **23**, 108-135.
 12. ———. Young Radicals. New York: Harcourt Brace, 1968.
 13. KERPELMAN, L. C. Activists and Nonactivists: A Psychological Study of American College Students. New York: Behav. Publ., 1972.
 14. LIPSET, S. M. The activists: A profile. In D. Bell & I. Kristol (Eds.), *Confrontation: Student Rebellion and the Universities*. New York: Basic Books, 1969.
 15. ———. American student activism. In G. R. Weaver & J. H. Weaver (Eds.), *The university and Revolution*. Englewood Cliffs, N. J.: Prentice-Hall, 1969.
 16. NIKELLY, A. G. Ethical issues in research on student protest. *Amer. Psychol.*, 1971, **26**, 475-478.
 17. NUNNALLY, J. C. Psychometric Theory. New York: McGraw-Hill, 1967.
 18. ROSENTHAL, R. Experimenter Effects in Behavioral Research. New York: Appleton-Century-Crofts, 1966.
 19. SADAVA, S. W. College student drug use: A social psychological study. Unpublished Doctoral dissertation. University of Colorado, Boulder, 1970.
 20. ———. A field-theoretical study of college student drug use. *Can. J. Behav. Sci.*, 1971, **3**, 337-346.
 21. ———. Becoming a marijuana user: A longitudinal social learning study. Mimeographed paper presented at the meeting of the Canadian Psychological Association, Montreal, June, 1972.
 22. SCOTT, W. A. Values and Organizations: A Study of Fraternities and Sororities. Chicago: Rand McNally, 1965.
 23. SELVIN, H. C., & HAGSTROM, W. O. Determinants of support for civil liberties. In S. M. Lipset & S. S. Wolin (Eds.), *The Berkeley Student Revolt: Facts and Interpretations*. Garden City, N. Y.: Doubleday, 1965.
 24. SHEETS, C. A., JR. The personal control structure and deviant behavior. Mimeographed paper, Institute of Behavioral Science, University of Colorado, Boulder, 1970.
 25. SINGER, B. F. Toward a psychology of science. *Amer. Psychol.*, 1971, **26**, 1010-1015.
 26. SOLOMON, F., & FISHMAN, J. R. Youth and peace: A psycho-social study of student peace demonstrators in Washington, D. C. *J. Soc. Issues*, 1964, **20**, 54-73.
 27. THOMAS, L. E. Family correlates of student political activism. *Devel. Psychol.*, 1971, **4**, 206-214.
 28. ULLMAN, A. D. The first drinking experience of addictive and "normal" drinkers. *Quart. J. Stud. Alcoholism*, 1953, **14**, 181-191.
 29. YINGER, J. M. Toward a Field-Theory of Behavior: Personality and Social Structure. New York: McGraw-Hill, 1965.

Interuniversity Psychological and Counseling Center
Vanderbilt University
300 Oxford House
1313 21st Avenue South
Nashville, Tennessee 37212

ABSOLUTE AND RELATIVE BIDIRECTIONAL TRANSFER IN VERBAL CONFLICT RESOLUTION TASKS*¹

University of Richmond

JOHN M. BRAME AND KENNETH A. BLICK²

SUMMARY

One group of Ss resolved 10 double approach-avoidance (DAP-AV) verbal conflicts followed by 10 approach-approach (AP-AP) conflicts, and another group transferred from AP-AP to DAP-AV. Two additional groups, which resolved 20 conflicts of the same type (AP-AP or DAP-AV), were used in assessing relative transfer effects. Results indicated longer resolution times associated with DAP-AV conflicts ($p < .05$), but no absolute or relative transfer in either direction. Failure to demonstrate transfer effects may have resulted from interference in the production of a response set or from the failure of a specific response set to generalize to a new task.

A. INTRODUCTION

The spread of conflict hypothesis refers to the generalization of behavior from one conflict situation to another. Support for the hypothesis was demonstrated in a study by Worell (6), in which the task used was a brightness discrimination conflict and the dependent variable was reaction latency, or the time required to initiate a decision. The Ss were initially exposed to a low conflict condition which was produced by requiring Ss to discriminate between a very bright and a very dim light. Following the low conflict condition, five training conditions were administered. In the high conflict conditions, two equally bright (Group I) or equally dim (Group II) lights were presented. For intermediate conflicts, relatively bright and dim lights were presented (Groups III and IV). The fifth condition consisted of continued training with the original low conflict (Group V). Subsequent to the differential interpolated training procedures, all Ss were presented with the original low conflict task. Results showed that the differ-

* Received in the Editorial Office on July 11, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research was supported in part by a Faculty Research Grant from the University of Richmond.

² Requests for reprints should be sent to the junior author at the address shown at the end of this article.

ential training conditions produced different speeds of conflict resolution as expected. High conflict groups took longer to resolve the discriminations than did intermediate conflict groups, which were also slower than the low conflict group. A beneficial practice effect was also shown for Groups III, IV, and V; however, no such effect was exhibited by Groups I and II.

The major finding of Worell (6) concerned the effects of practice at different conflict levels upon later performance in resolving easy conflicts. An analysis of the difference scores (postconflict performance minus pre-conflict performance) showed that high conflict groups were significantly impeded in reaction time as compared to intermediate and low conflict groups. Worell considered his results as offering primary support for the competing response hypothesis of conflict behavior. The hypothesis holds that exposure to conflict leads to the learning of conflict-specific responses, and such responses are generalized to related conflicts along dimensions of similarity of situations. Thus, exposure to strong conflicts produced longer reaction time responses which were generalized to similar weak conflicts and resulted in impaired performance.

Arkoff (1) extended the study of conflict behavior into the area of verbal conflicts in an attempt to involve Ss emotionally. Using seven positive personal characteristics, he constructed all possible paired comparisons. The Ss had to designate which of two positive characteristics they would rather have to a greater degree. For example, choosing between more attractive and more healthy simulated an approach-approach (AP-AP) conflict. In addition, avoidance-avoidance (AV-AV) conflicts were simulated by having Ss choose which characteristics they would rather possess to a lesser degree: e. g., less attractive or less healthy. Following conflict resolution, Ss were asked to sort the conflicts into two stacks, one for conflicts they considered more difficult, one for those judged less difficult. Arkoff measured time in resolving each conflict and the number of conflicts of each type judged to be easier to resolve. Results indicated that AV-AV conflicts required significantly more time to resolve than AP-AP conflicts. In addition, on the basis of Ss' subjective evaluation, AP-AP conflicts were judged to be easier to resolve than AV-AV conflicts. Therefore, Arkoff found it was possible to define easy and difficult conflicts on the basis of conflict types.

Using a different approach in measuring verbal conflict difficulty, Edwards and Diers (2) examined resolution behavior displayed in AP-AP and AV-AV conflicts as related to the tendency of individuals to respond in a socially desirable manner on personality inventories. Items from the Edwards Personal Preference Schedule (EPPS) constituted the conflicts in

this study. The EPPS is so constructed that the two alternative responses for each item are approximately equal in terms of judged social desirability (SD). Further the relative amount of SD associated with each alternative has been found. From this information AP-AP conflicts (items with high SD) and AV-AV conflicts (items with low SD) were identified. The EPPS was administered with special instructions that *S* could omit items which he felt were too difficult. The rationale was that removing pressure to respond would allow *S* to block when difficult items were encountered. The results showed that response omissions were more frequently made in connection with AV-AV conflicts than with AP-AP conflicts.

In view of the evidence presented concerning spread of conflict in motor tasks (6), the present study is concerned with transfer of conflict in verbal tasks. Specifically, if such an effect is operative with verbal stimuli, then practice in solving difficult conflicts would impede the subsequent resolution of similar easy conflicts; and, perhaps, prior exposure to easy conflict situations would be expected to enhance performance under strong conflicts. Difficult conflicts in the present study were defined as double approach-avoidance (DAP-AV) conflicts, and easy conflicts were defined as AP-AP conflicts. In addition to the bidirectional aspect of transfer, the present study investigated transfer from an absolute and a relative point of view. Absolute transfer refers to performance on a second task by an experimental group compared to the initial performance by a control group on the same task. If the second task performance of the experimental group is compared to a control group which has had prior practice on the same task, any resulting transfer effects are considered to be relative.

B. METHOD

1. Subjects

A total of 82 male and female students from three introductory psychology classes at the University of Richmond served as *Ss*. Participation in the present study was a requirement of the introductory psychology course. The data of 80 *Ss* who completed the task were analyzed. Data from one *S* were eliminated because of failure to follow instructions, and data from another *S* were eliminated because extraneous noise adjacent to the experimental room.

2. Apparatus and Materials

The apparatus used for the individual conflict resolution task was the modified conflict board used by Fracher and Blick (3), and equipped with a

Hunter silent timer. Although the apparatus was designed to allow for the performance and measurement of both motor and verbal conflicts, only the verbal conflict portion was used in this study. The apparatus consisted of a plywood platform divided in the middle by an opaque partition 18 inches in height. There were three slots in the vertical partition which allowed 3×5 index cards to be passed between *E* and *S*. As cards were inserted through the center slot toward *S*, a silent timer was automatically activated. Reinsertion through either the right or left slot toward *E* deactivated the timer.

The verbal conflicts posed to *Ss* were formed by pairing personal characteristic adjectives as originally conceived by Arkoff (1). All verbal conflicts were typed on 3×5 index cards. Across the top of all cards appeared the words: "Would you rather be." Below these words appeared the alternatives, one typed on the left and one typed on the right side of the card. The conflicts appeared in two formats, each containing 16 words. An example of the AP-AP conflict format was as follows: "Would you rather be more healthy than you are now—more intelligent than you are now?" The DAP-AV conflicts took the following form: "Would you rather be more healthy but less intelligent—more intelligent but less healthy than now?" An additional sample card was prepared for use during the preliminary instructions to *Ss*. The purpose of this card was to familiarize *Ss* with the format of the conflicts that would be presented. The sample card followed the AP-AP format and paired two adjectives, dependable and tolerant, which were not used in this study.

The seven personal characteristic adjectives used in this study (confident, healthy, honest, intelligent, popular, sincere, well-adjusted) were seven of the eight judged highest in personal desirability in the Powell (5) study. Powell had students rank order 14 adjectives, and an overall ranking was formulated on the basis of median rank order values. Powell's assumption was that pairing items high in personal desirability produced equally difficult conflict situations. For the seven characteristics used in the present study, all possible pairings resulted in 21 pairs. Since only 20 pairs were needed (for 20 trials), one pair was randomly omitted. As a result of the pairing procedure, each adjective (except for sincere and well-adjusted) was matched with six other adjectives.

3. Procedure

The *Ss* were randomly assigned to one of the four conditions. In all conditions *Ss* were presented with 20 conflicts by use of the modified con-

flict resolution board. The first 10 conflicts and the last 10 conflicts were either similar or dissimilar in type (AP-AP or DAP-AV), depending upon the experimental condition. The four experimental conditions and groups are delineated as follows: DAP-AV followed by DAP-AV (DAP-AV: DAP-AV); AP-AP followed by DAP-AV (AP-AP: DAP-AV); AP-AP followed by AP-AP (AP-AP: AP-AP); DAP-AV followed by AP-AP (DAP-AV: AP-AP).

For the individual conflict resolution task, Ss were instructed that they would receive index cards through the center slot of the apparatus. They were told to read the conflicts which appeared on the cards and to choose one of the alternatives. If they chose the left alternative, they were to return the card through the slot to their left. If the right alternative was selected, the card was to be returned through the right-hand slot. The Ss were told: "In resolving these conflicts, imagine that each conflict really confronts you. Be sure that your choice is one you would make if you really had to decide. Take as much time or as little time with each card as you like." Following one sample card to insure that S understood the directions, the experimental task began. Conflicts of the appropriate type were presented in random order, and resolution time for each conflict was measured to the nearest hundredth of a second. The intertrial interval ranged from 6.9 to 9.9 seconds.

C. RESULTS

An analysis of variance was conducted to determine if different resolution times were produced in the resolution of AP-AP and DAP-AV conflicts the first time either of these tasks was encountered. The mean speed of resolution for AP-AP conflicts was 11.93 seconds, as opposed to 17.59 seconds for DAP-AV conflicts. The results indicated that the means were significantly different [$F(1, 78) = 18.64, p < .05$], and no effects due to trials or interaction were indicated. Four analyses of variance conducted for the bidirectional absolute and relative transfer comparisons yielded no major significant differences.

Additional analyses were conducted concerning the personal characteristic alternatives most often chosen by males and females. Such a comparison was possible, since a record was kept of the actual choices made by each S in each conflict situation. Multiple tests of the significance of differences between proportions of males and females choosing a given alternative yielded a few significant findings; however, out of a total of 40 comparisons, these findings could in fact be the result of an alpha error.

D. DISCUSSION

The object of the analysis of resolution time scores for the two types of conflict prior to any other practice in conflict resolution was to determine if the tasks were, in fact, different. Results revealed that AP-AP conflicts were resolved significantly faster than DAP-AV conflicts upon initial encounter. The lack of a beneficial trial effect operating within either task was an unexpected result because an increase in speed across trials has been the usual finding in studies of conflict produced in brightness discrimination tasks (6, 7).

The null results regarding absolute and relative transfer between the two tasks of this study lend no support to the spread of conflict hypothesis. There are two possible explanations as to why no transfer effects were shown. First, the hypothesized conflict-specific response set may never have been established during first task performance and, therefore, never exerted an influence on second task responses. Second, a response set might have been produced during the first task, but it could have failed to achieve generalization to the second task because the stimulus situations were not similar enough.

All things considered, it appeared that the first reason was the more feasible. Ten trials were perhaps too few to allow formation of a conflict-specific response in the task used here. In Worell's (6) study, Ss received 24 trials with difficult conflicts prior to transfer to much easier conflicts.

An additional and more compelling factor that could account for the lack of an established response set was that Ss experienced interference in their resolution performance. One possible source of interference was the repetition of the adjectives themselves. Since only seven characteristics were used to form conflicts, each one appeared five or six times. The Ss, in attempting to maintain consistency in their decisions, could have been concerned with their responses to conflicts containing elements that they had already encountered. Thus, Ss would not have been merely resolving individual conflicts, but recalling and comparing conflicts containing the same elements before making a decision.

Another possible source of interference was related to that just described and stemmed again from the fact that the same adjectives appeared several times. An experiment by Gerard (4) was concerned with examining the predecision and postdecision behaviors of Ss who chose between two paintings which they valued approximately equally. Gerard found that most Ss gave more attention to the nonchosen alternative before a decision was made and

to the chosen alternative following a decision. He also represented evidence that an evaluational change occurred in the period following a decision. The nature of this change was that the chosen alternative increased in value relative to the nonchosen alternative.

Since adjectives in the present study were presented a number of times, subsequent decisions might have been disrupted by the "biased" attending patterns resulting from prior exposure to the same adjectives. For example, in a given situation if *S* chose honest, and thereby rejected confident, in a later conflict containing honest, he might direct more attention to this stimulus than to its alternative. Such "biased" attending could alter resolution time depending upon what the alternative adjective happened to be. Conversely, in later conflicts containing confident, *S* might give less attention to this stimulus, again affecting the resolution time in an unstable manner. Also, an increase or decrease in value associated with a particular adjective might disrupt subsequent conflicts in a nonsystematic way. Of course, the extent of such disruptions would depend upon such factors as the proximity in time of the same adjective, the number of encounters with that adjective, and *S*'s ability to recall his choices and rejections of previously presented stimuli. At any rate, it seems quite probable that the reoccurrence of identical adjectives may have exerted a disruptive influence upon the establishment of a stable response set and thereby prevented the transfer of responses between the two tasks.

REFERENCES

1. ARKOFF, A. Resolution of approach-approach and avoidance-avoidance conflicts. *J. Abn. & Soc. Psychol.*, 1957, **55**, 402-404.
2. EDWARDS, A. L., & DIERS, C. J. Social desirability and conflict. *J. Soc. Psychol.*, 1962, **58**, 349-356.
3. FRACHER, J. C., & BLICK, K. A. Speed of motor conflict resolution as related to type of conflict and manifest anxiety. *J. of Psychol.*, 1973, **83**, 277-285.
4. GERARD, H. B. Choice difficulty, dissonance, and the decision sequence. *J. Personal.*, 1967, **35**, 91-108.
5. POWELL, N. R. Influence of vicarious reinforcement on an observer's speed of conflict resolution. Unpublished Master's thesis, University of Richmond, Richmond, Virginia, 1971.
6. WORELL, L. Response to conflict as determined by prior exposure to conflict. *J. Abn. & Soc. Psychol.*, 1962, **64**, 438-445.
7. WORELL, L., & CASTANEDA, A. Individual differences in conflict resolution and the ease of learning. *Amer. Psychol.*, 1961, **16**, 400.

Department of Psychology
University of Richmond
Richmond, Virginia 23173

AN ANALYSIS OF SUPPLEMENTARY SUBTESTS AND THEIR INFLUENCE ON TOTAL WISC SCORES OF HIGH ACHIEVING STUDENTS*

The Ohio State University

ANN W. ENGIN

SUMMARY

A study was conducted for the purpose of determining whether or not the addition of one or both of the supplementary WISC subtests, Digit Span of the Verbal Scale—and Mazes of the Performance Scale, materially affected the obtained *IQs* for high achieving fifth grade subjects. All 12 subtests of the WISC were individually administered to 44 Ss, and *IQs* were then calculated in such a manner that specific comparisons could be made. These comparisons were between Verbal, Performance, and Full Scale *IQs* composed of the maximum number of subtests, and Verbal, Performance, and Full Scale *IQs* exclusive of Digit Span, Mazes, or both subtests. Analyses by use of *t* tests for correlated means revealed highly significant differences. The addition of Digit Span and Mazes in the WISC battery served to depress the Verbal, Performance, and Full Scale *IQs* of the high achieving Ss.

A. INTRODUCTION

The Wechsler Intelligence Scale for Children [WISC (5)] is used widely in individual psychological examinations of youngsters and has been the subject of much research study to determine the types of factors that influence obtained test results. Littell (2) and Zimmerman and Woo-Sam (6) have summarized the extensive research related to the use of this popular instrument.

Although research has been devoted to the investigation of many internal factors that may affect test results, no investigation has attempted to test the validity of Wechsler's statement: "The addition of the sixth Verbal or Performance test, or both, ordinarily will not change the *IQs* materially, but will provide more observational data for the examiner" (5, p. 19). The present study was, therefore, designed and implemented to determine

* Received in the Editorial Office on July 11 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

whether the addition of the supplementary subtests, Digit Span and Mazes, would significantly alter WISC *IQs*. More specifically the investigator attempted to ascertain whether or not the Verbal, Performance, and Full Scale *IQs* would be significantly changed if high achievers were employed as subjects. High achieving *Ss* were selected for the present investigation because past research (1, 3, 4) indicates clearly that the high achieving *S* receives a significantly lower *IQ* on the usual complement of 10 WISC subtests when compared to the score on the Binet. Therefore, adding two more subtests to the WISC could serve to lower further the *S's* quantifiable *IQ*.

B. METHOD

1. Subjects

The 44 high achieving children chosen for the present study were obtained from a population of 119 fifth graders within one midwestern elementary school. The criteria used in the selection of the high achievers were high scores on the reading and arithmetic sections of the California Achievement Test (Elementary, Form W) and teacher nomination.

The sample thus chosen was comprised of 20 males and 24 females whose ages ranged from 10 years 3 months to 12 years 1 month and whose WISC Full Scale *IQs* ranged from 103 to 134. Reading Achievement on the California Achievement Test expressed in grade placement scores ranged from 6.4 to 8.7; arithmetic achievement on the California Achievement Test ranged from 5.3 to 7.8. Actual grade placement at the time of testing was 5.8.

2. Procedure

All 12 subtests of the WISC were administered individually to the 44 *Ss* by the investigator. Test protocols were scored so that the following *IQs* were available: (a) Verbal prorated for all six subtests; (b) Verbal for five subtests (Digit Span excluded); (c) Performance prorated for all six subtests; (d) Performance for five subtests (Mazes excluded); (e) Full Scale for all 12 subtests; (f) Full Scale for 10 subtests (Digit Span and Mazes excluded); (g) Full Scale for 11 subtests (Digit Span excluded); (h) Full Scale for 11 subtests (Mazes excluded).

A *t* test for correlated means was chosen in order to analyze the resulting data. More specifically the *t* test of correlated means was employed because the investigator was making comparisons between sets of scores on the same individuals under two different conditions.

C. RESULTS

Prior to the statistical analysis of the data collected for the study, a frequency matrix was formulated so that the investigator could examine the individual *IQs* and the resulting differences for each of the five sets of scores. Inspection of the matrix revealed general trends which were later quantified more definitively by the statistical analysis.

TABLE 1
INCREASES AND DECREASES IN WISC *IQs* WITH THE EXCLUSION OF
SUPPLEMENTARY SUBTEST SCORES

Test	Number showing		
	No change	Decrease	Increase
Verbal <i>IQ</i> (Digit Span excluded)	6	5	33
Performance <i>IQ</i> (Mazes excluded)	1	5	38
Full Scale <i>IQ</i> (Digit Span and Mazes excluded)	7	2	35
Full Scale <i>IQ</i> (Digit Span excluded)	9	4	31
Full Scale <i>IQ</i> (Mazes excluded)	13	5	26

Wechsler's (5) statement concerning the supplementary subtests, Digit Span and Mazes, points toward the expectation that the addition of the subtests would not materially affect the *IQs*. The expectation, however, is not observed in the present data (see Table 1), since a tendency is noted more often for the *IQ* to increase as a function of eliminating one or both of the supplementary tests. The results do not appear to support Wechsler's suggestion, but rather point to a marked lowering of *IQ* with the inclusion of the supplementary tests.

The results of the five *t* tests are summarized in Table 2. In each instance the obtained *t* value was greater than the initial *t* value of 3.551 ($df = 43$, $p < .001$). The results supplied further evidence that a statistically significant difference existed between the 10 and 12 WISC subtest batteries (see Table 2). That is, including the two supplementary WISC subtests, Digit Span and Mazes, significantly lowered the Verbal, Performance, and Full Scale *IQs* of the high achieving fifth grade *Ss* included in the present study.

The results of the present investigation fail to support Wechsler's contention that the addition of one or both of the supplementary subtests of the WISC will not materially affect *IQs*. Rather, with high achieving children, the addition of the Digit Span and Mazes subtests significantly lowered the Verbal, Performance, and Full Scale *IQs*. In fact, psychologists may be penalizing bright children by including the two supplementary subtests, rather than merely obtaining additional data, as Wechsler suggests.

TABLE 2

t VALUES FOR THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN WISC *IQ* MEANS
FOR CORRELATED SAMPLES

Comparison	<i>t</i>
Verbal <i>IQ</i> (with vs. without Digit Span)	-5.8219*
Performance <i>IQ</i> (with vs. without Mazes)	-5.2884*
Full Scale <i>IQ</i> (with vs. without Digit Span and Mazes)	-7.0876*
Full Scale <i>IQ</i> (with 12 subtests vs. Digit Span excluded)	-5.3585*
Full Scale <i>IQ</i> (with 12 subtests vs. Mazes excluded)	-4.5826*

* $p < .001$.

The research finding acquires special significance when psychologists consider that WISC scores tend to be lower than Stanford-Binet Scores for the same children within the middle and upper ranges and that this appears to be particularly true for children below 10 and for the higher Stanford-Binet scores (2).

D. DISCUSSION

The implications for the users of the WISC are clearly evident. That is, when evaluating children whose past records indicate high achievement, psychologists can expect lowered *IQ*s if they administer the Digit Span and Mazes. This admonition is particularly apt when the WISC is the primary instrument used to determine entrance into a program for academically talented children or into a private school, since an inflexible minimal *IQ* is often the major criterion for admission. The fact that the WISC lacks sufficient range to measure very high abilities dependably may dissuade its use with these children. It might be argued that by administering all 12 subtests of the WISC to such children, psychologists are in effect penalizing them twofold. Knowledge of the characteristic of the WISC revealed in the present study should, therefore, enable the psychologist not only to improve his choice of tests, but also to interpret the results with greater critical acumen.

REFERENCES

1. KRUGMAN, J. J., JUSTMAN, J., WRIGHTSTONE, J. W., & KRUGMAN, M. Pupil functioning on the Stanford-Binet and the Wechsler Intelligence Scale for Children. *J. Consult. Psychol.*, 1951, 15, 475-483.

2. LITTELL, W. M. The Wechsler Intelligence Scale for Children: Review of a decade of research. *Psychol. Bull.*, 1960, **57**, 132-156.
3. LUCITO, L., & GALLAGHER, J. Intellectual patterns of highly gifted children on the WISC. *Peabody J. Educ.*, 1960, **38**, 131-136.
4. PASTOVIC, J. J., & GUTHRIE, G. M. Some evidence on the validity of the WISC. *J. Consult. Psychol.*, 1951, **15**, 385-386.
5. WECHSLER, D. Wechsler Intelligence Scale for Children. New York. Psychol. Corp., 1949.
6. ZIMMERMAN, I. L., & WOO-SAM, J. Research with the Wechsler Intelligence Scale for Children. *Psychol. Sch.*, 1972, **9**, 232-271.

College of Education

The Ohio State University

1945 North High Street

Columbus, Ohio 43210

RESPONSE TO STIMULUS UNCERTAINTY IN FOUR-, SIX-, AND EIGHT-YEAR-OLD CHILDREN*

University of Victoria, Canada; and University of Keele, England

RICHARD B. MAY AND CORINNE HUTT¹

SUMMARY

Forty-eight school children were allowed to play with a button-press light-display apparatus. Four-, six-, and eight-year-old groups all pressed more for high uncertainty (eight lights) than for low uncertainty (one light), but the effect was most pronounced for the youngest age group. Two minutes of pretest sensory restriction for half the subjects had no reliable effect upon their button-pressing behavior. In addition, most children stated that they "liked best" the high uncertainty stimulus display. However, even those who verbalized other preferences still pressed more for the high uncertainty display, emphasizing the difficulty of comparing overt choices with verbally stated preferences.

A. INTRODUCTION

In developing the notion of collative properties of stimulation and their relation to attention, Berlyne (2) gave several names to the different manipulations of stimulus variability, and a number of studies have tried to demonstrate operationally the effectiveness of each type of manipulation. Hutt (7) reviewed a number of the studies dealing with collative properties and attention in children. She concluded that most of these properties can conveniently be subsumed under the terms "novelty" (5) and "complexity" (9), but more precise classification of any particular variable seems open to conjecture. However, some attempts to delineate specific experimental manipulations that correspond to Berlyne's list of collative properties have been fairly successful. For example, Rabinowitz and Robe (11) associated different

* Received in the Editorial Office on July 12, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The work of the first author was supported partially by a leave fellowship from the Canada Council and partially by grant A0342 from the National Research Council of Canada. The work of the second author is supported by the Medical Research Council of Great Britain. The authors wish to thank John Hutt for his helpful comments on a preliminary version of this paper. Requests for reprints may be sent to R. B. May at the address shown at the end of this article.

stimulus manipulations with stimulus change, complexity, relative novelty, surprise, and uncertainty. With the exception of the uncertainty manipulation, each variable proved to be an effective determinant of button-pressing behavior in 10-year old children.

Rabinowitz and Robe interpreted the failure to obtain a significant effect due to uncertainty to be theoretically important, since this property of stimuli is listed as a basic collative variable relating conflict and choice behavior in Berlyne's theoretical formulations (2). One plausible reason they gave for failure to find an uncertainty effect was that stimulus variability and response variability were confounded. Their subjects had a choice of six different response buttons which could lead to the onset of six different stimulus lights. Secondly, it was possible that a sufficiently wide range of uncertainty was not used. In their minimum uncertainty condition, pressing a particular button might bring the onset of one of two lights, while in the maximum uncertainty condition, pressing the critical button might bring the onset of one of five lights.

The major goal of the present study was to investigate the effect of stimulus uncertainty upon children's choices and degree of responsiveness by remedying the two procedural limitations of the study by Rabinowitz and Robe. To provide a sufficient range of stimulation, four levels of uncertainty were employed, and to minimize the confounding of stimulus and response uncertainty, all responses were confined to a single button.

Since the effects of some types of variability have been shown to vary with age of subject (8, 10), three different age groups were studied. In addition, the immediate past experience of the subject in terms of gross sensory input was evaluated. Inclusion of this variable is supported by data from Berlyne (3) who concluded that level of exteroceptive information processing just before the choice can be an important factor determining choice.

B. METHOD

1. *Subjects*

Forty-eight English children aged four to nine years served as subjects. Sixteen four-year-old subjects ($M = 53.7$ months) attended a preschool in Oxford. Sixteen six-year-olds ($M = 75.2$ months) and 16 eight-year-olds ($M = 94.4$ months) attended a state primary school in a nearby community. There were an equal number of boys and girls at each age level. With the exception of these age and sex restrictions, the subjects were randomly selected from the school population available for testing. All Ss were tested

during the months of January and February in a spare room of their school building.

2. Apparatus

The apparatus consisted of a white enamel stimulus panel with eight small green lights arranged in a circle (radius 3-1/2 inches). Centered below this array was a single response button which, when pressed, activated one of the eight lights. The particular light that came on depended upon the treatment condition. There were four conditions: (a) one-light, every response activated the same single light; (b) two-lights, each response activated one of two lights in a random sequence; (c) four-lights, a response activated one of four lights; and (d) eight-lights, any one of the eight lights was activated. Within a condition, the sequence of lights was controlled by a preset random generator which repeated its sequence after 100 outcomes. There was no other restriction on the randomness, which means that in the multiple-light conditions it was possible for a given light to be activated several times in succession before another light was activated.

The interval between button press and the light onset was .5 seconds, and the duration of light onset was 1.0 second. While *E* actually controlled the light condition which was activated, the *S* indicated his choice of light condition on his own "control" panel by moving a clock-hand to one of four positions. Each position denoted a light condition by the respective digit (number 1, 2, 4, or 8) as well as the number of lights operative being shown as green dots.

3. Procedure

There were three stages of the experiment: (a) familiarization with the button-pressing apparatus; (b) a delay during which half the subjects were exposed to reduce sensory input; and (c) free-choice response period to the button-pressing apparatus. During the familiarization period *S* was asked to press the button and see what happened. When the light went off, *S* was told that he could continue to press to make a light come on. The *E* operated the light-condition selector so that each *S* made at least eight responses to each of the light conditions. After this, *E* again described the four light conditions, using the *S*'s clock-hand to demonstrate the difference in the ensembles available. It was emphasized that "the number of lights" referred to the number of lights that were potentially operative, although any one press would only activate a single light.

Following familiarization with the apparatus, half the *Ss* (four boys and

four girls in each age group) were asked to help with a simple task before they continued to play with the toy. A "deprivation box," 12 inches by 18 inches by 24 inches, was set before *S*, and he was asked to watch a 1-1/2 cm orange star which was centered on the interior rear wall of the box. Aside from the star, all visible features of the box were homogeneous and neutral brownish-grey in color. The *S* sat close enough to the box so that his head was in the box with the box-ends acting as blinders. The *S* was asked to watch the star in the box to see if it moved, and to do so for 120 seconds. The star was never moved. Although *S*s were not severely deprived in these circumstances, at least sensory input was considerably reduced in comparison with what was normally experienced. The nondeprived *S*s spent 120 seconds talking with *E*.

Following differential sensory restriction, *S*s were immediately presented the light display panel and told that they could now play with it freely. The *S* was told that he could press the button as often as he wished, that he could change the number of lights by moving the clock-hand on his control panel, and he could do these things often as he liked, stopping whenever he wished. The *E* recorded the light conditions chosen and the number of presses following each choice. A note was also made of any comments or statements *S* made. After *S* either stated that he was finished with the toy or sat for 15 seconds without pressing the button, he was asked what pattern (number of lights) he liked best.

C. RESULTS AND DISCUSSION

Three different measures of button-pressing activity were analyzed: (a) number of choices of each level of uncertainty; (b) total presses at each level; and (c) the number of presses per choice. These data were submitted to $3 \text{ (age)} \times 2 \text{ (sex)} \times 2 \text{ (deprivation)} \times 4 \text{ (uncertainty)}$ analysis of variance with repeated measures on the uncertainty variable. All main effects and interactions involving the sex and deprivation variables were nonsignificant for each dependent variable. There was a significant effect due to uncertainty with generally higher levels of responding under the conditions with greater uncertainty. The main effect due to levels of uncertainty was reliable for number of choices [$F(3, 108) = 3.59, p < .025$]; total presses [$F(3, 108) = 28.11, p < .001$]; and presses per choice [$F(3, 108) = 24.49, p < .001$]. This was the only reliable effect for the number of choices variable.

Since the results for total presses and press per choice were very similar, only the latter will be reported in detail. The four-year-old group ($M =$

13.57) pressed more than either the six-year-old ($M = 9.67$) or eight-year-old ($M = 9.05$) [$F(2, 36) = 5.06, p = .012$]. However, there was a significant interaction between age of subject and amount of uncertainty [$F(6, 108) = 3.53, p = .003$] which limits the generality of the uncertainty and age main effects. Figure 1 gives a plot of the means for this interaction for the number of presses per choice variable. It can be seen that the age effects are largely attributable to the high level of responding in four-year-old group responding to the eight-light condition. Analysis of simple main effects indicated that the effects of uncertainty were significant at each age level. The four-year-old group pressed more for the higher levels of uncertainty [$F(3, 108) = 23.92, p < .001$], and so did the six-year-old group [$F(3, 108) = 3.55, p < .05$] and the eight-year-old group [$F(3, 108) = 4.16, p < .01$].

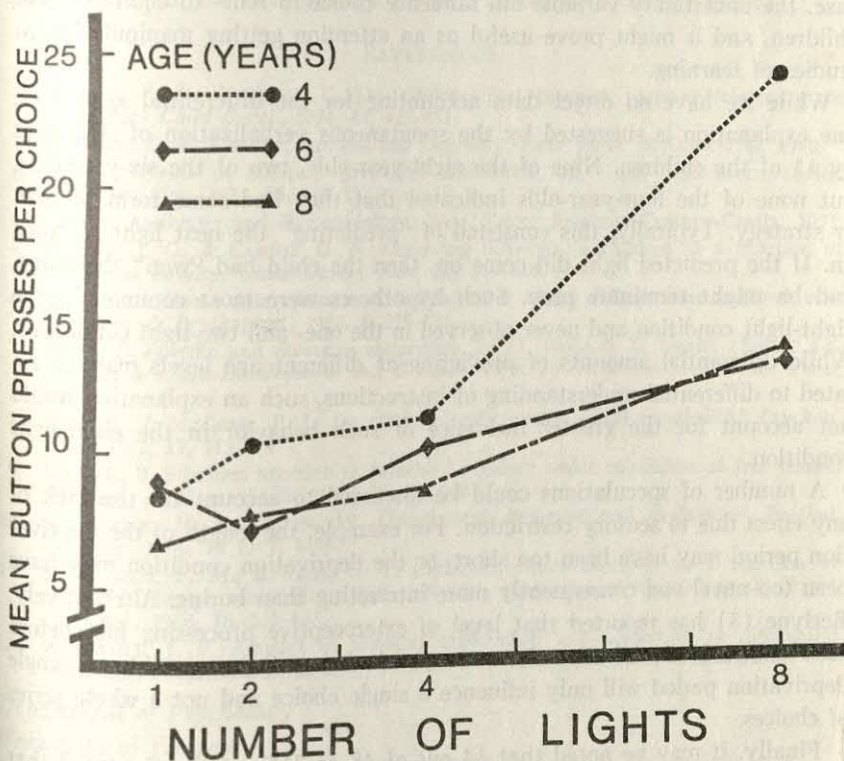


FIGURE 1

MEAN BUTTON PRESSES PER CHOICE FOR THREE AGE GROUPS UNDER FOUR LEVELS OF UNCERTAINTY (NUMBER OF LIGHTS)

In general, the degree of uncertainty affected all three response measures in a similar manner; the greater the uncertainty, the greater the number of responses and the more frequently was the higher uncertainty level selected. In absolute terms the youngest children were the most responsive, and they distributed their responses over the four light conditions in a more extreme manner than did the older children. However, the younger children did not shift their choices more frequently; they simply pressed more once they had made their choice. The fact that uncertainty, as defined by the number of unpredictable lights in a display, influenced the level of response and direction of choice, supports the utility of such a construct as suggested by Berlyne (2). This outcome also suggests that perhaps the negative finding reported by Rabinowitz and Robe (11) was due to specific limitations of method rather than general limitations of the uncertainty construct. In any case, the uncertainty variable did influence choice in four- to eight-year-old children, and it might prove useful as an attention getting manipulation in studies of learning.

While we have no direct data accounting for the differential age effect, one explanation is suggested by the spontaneous verbalization of strategies by 11 of the children. Nine of the eight-year-olds, two of the six-year-olds, but none of the four-year-olds indicated that they had some form of plan or strategy. Typically, this consisted of "predicting" the next light to come on. If the predicted light did come on, then the child had "won" the game, and he might terminate play. Such hypotheses were most common in the eight-light condition and never observed in the one- and two-light conditions. While differential amounts of predicting at different age levels may be related to differential understanding of instructions, such an explanation would not account for the greater incidence of such behavior in the eight-light condition.

A number of speculations could be discussed to account for the lack of any effect due to sensory restriction. For example, the length of the deprivation period may have been too short, or the deprivation condition may have been too novel and consequently more interesting than boring. Alternatively, Berlyne (3) has reported that level of exteroceptive processing just before *each* choice is an effective determinant of choice. Quite possibly, a single deprivation period will only influence a single choice and not a whole series of choices.

Finally, it may be noted that 34 out of 48 or 71% of the Ss stated that they "liked best" the eight-light display: i. e., the condition to which they also responded the most. Those liking other displays were randomly dis-

tributed across the various age, sex, and deprivation conditions (34/48, $z = 2.89$, $p < .002$). They were generally unable to formulate reasons for their preference, though one articulate eight-year-old remarked that "it was the most pleasing formation." It is often assumed that statements of preference or liking are expressions of an affective dimension of behavior, whereas an operation like looking or button-pressing is more part of a cognitive function (4, 6, 12). If this distinction is valid, the present data suggest that through the age of eight years, children do not necessarily distinguish between the affective and cognitive dimensions. They appear to like what engages their attention most (1). Such a conclusion is probably an oversimplification, since 10 of the 14 children who stated they liked the one-, two-, or four-light display still responded most to the eight-light ensemble. While we may be able to elucidate some of the factors that control attention in children, the determinants of their preferences remain elusive.

REFERENCES

1. AITKEN, P. P., & HUTT, C. Do children find complex patterns interesting or pleasing? *Child Devel.*, 1974, **45**, 425-431.
2. BERLYNE, D. E. *Conflict, Arousal and Curiosity*. New York: McGraw-Hill, 1960.
3. ———. Effects of auditory prechoice stimulation on visual exploratory choice. *Psychon. Sci.*, 1971, **25**, 193-194.
4. ———. *Aesthetics and Psychobiology*. New York: Appleton-Century-Crofts, 1971.
5. CANTOR, J. G., & CANTOR, G. N. Observing behavior in children as a function of stimulus novelty. *Child Devel.*, 1964, **35**, 119-128.
6. DAY, H. I. Some determinants of looking time under different instructional sets. *Percept. & Psychophys.*, 1968, **4**, 279-281.
7. HUTT, C. Specific and diversive exploration. In H. Reese & L. Lipsitt (Eds.), *Advances in Child Development and Behavior* (Vol. 5). New York: Academic Press, 1970.
8. HUTT, C. & MCGREW, P. L. Do children really prefer visual complexity? *Psychon. Sci.*, 1972, **17**, 113-114.
9. MAY, R. B. Stimulus selection in preschool children under conditions of free choice. *Percept. & Motor Skills*, 1963, **16**, 203-206.
10. MUNSINGER, H. & KESSEN, W. Uncertainty, structure and preference. *Psychol. Monog.*, 1964, **78** (10), 1-24.
11. RABINOWITZ, F. M., & ROBE, C. V. Children's choice behavior as a function of stimulus change, complexity, relative novelty, surprise, and uncertainty. *J. Exper. Psychol.*, 1968, **78**, 625-633.
12. WOHLWILL, J. F. Amount of stimulus exploration and preference as differential functions of stimulus complexity. *Percept. & Psychophys.*, 1968, **4**, 307-312.

Department of Psychology
University of Victoria
Victoria, British Columbia, Canada V8W 2Y2

INFLUENCE THROUGH PERSONAL AND NONPERSONAL CHANNELS OF COMMUNICATION*¹

University of Maryland; and Westinghouse Health Systems, Columbia, Maryland

CHARLES D. WARD,² BARBARA L. SEBODA, AND VERNON B. MORRIS, JR.

SUMMARY

A city-wide campaign involving various channels of communication was conducted to obtain high school seniors for a survey. Of the 102 seniors who telephoned to make appointments, 56 later attended their assigned questionnaire session. The rate of attendance differed for the communication channels. Newspaper advertisements attracted the most telephone calls but had the lowest attendance rate; notices on bulletin boards in city recreation centers produced the fewest telephone calls but had the highest attendance rate. Other channels, including personal contact, were intermediate in effectiveness. Additional findings were that nonpersonal channels differed in influence, and that exposure through multiple channels resulted in more influence than exposure through only one. The implications of the findings, especially for conceptualizations of channel influence, were noted.

A. PROBLEM

An important distinction has been made in studies of the mass media between the mere transmission of information and the actual exercise of influence (3, 4). All media, including person-to-person contact, appear capable of transmitting information. Personal contact, however, generally has been found to be uniquely effective as a source of influence. The reason presumably is the active and direct role that the personal source can play relative to the intended target of the communication (8, p. 323).

The distinction between information and influence, although useful in explaining the superior influence of personal contacts, ignores the possibility

* Received in the Editorial Office on July 15, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research was supported by AFOSR Contract F44620-72-C-0093 awarded to Westinghouse Health Systems, Vernon B. Morris, Jr., Principal Investigator. The aid of Robert L. Crawford is gratefully acknowledged. Appreciation also is expressed to the Baltimore Bureau of Recreation for cooperation with the study.

² Requests for reprints should be sent to Charles D. Ward at the address shown at the end of this article.

that nonpersonal channels also can vary among themselves in influence. Moreover, the possibility that there are different kinds of influence, such as ability to obtain an expression of future compliance as well as obtaining the later compliance itself, also bears examination. The present study, carried out in a field setting, reports data relevant to these considerations.

Much of the past field research on communication channels has been dependent on the respondents' retrospective verbal reports of having been influenced. Such measures not only are obtrusive (7) but also seem particularly vulnerable to underreporting of such "undesirable" behavior as having been influenced. In contrast, an objective behavioral measure of influence—attendance at a later testing session—was employed in the present study. Another unusual feature of the present research was its focus on a novel population—high school seniors in a large eastern city.

B. METHOD

In early March of 1974 an advertisement appeared in the Sunday morning classified section of a major newspaper in Baltimore, Maryland. The ad read as follows: "HIGH SCHOOL SENIORS, BALTO. CITY—Earn \$5 for 1 hr. work in eve. Men and women who are seniors are needed to provide information about occupational decision making. Call (*phone number*) between 9 AM & 4:30 PM to see when we will meet in a location near you. . ." This advertisement, one of seven eventually placed in three different newspapers, was part of a concerted attempt during a 19-day period to solicit volunteers to serve in a study of occupational decision making among high school seniors.

A variety of other methods also was employed during the same period. One-page announcements were sent to all city recreation centers for posting on bulletin boards. Selected high school counselors were urged to inform their students of the sessions; flyers were also sent for posting on high school bulletin boards. (At one high school the announcement was even read over the public address system.) Many callers who responded were asked to tell a friend about the sessions. A similar request was made of the respondents who attended a data-collection session on the twelfth day of the campaign.

The immediate outcome of the recruitment activity was that 102 high school seniors telephoned to obtain further information. An attempt was made to obtain certain standardized information from each caller during the brief telephone interview. The information included the caller's high school and verification of senior status; personal information (name, address, telephone number, sex, race, and post-high school plans); the com-

munication channel through which the caller had heard about the research, as well as the date; and to whom, if anyone, the caller had spoken subsequently about the research, and when. At the conclusion of the conversation the caller was assigned a time and place for a later session in which a 15-page questionnaire was to be completed.³ All callers agreed to attend. The operational definition of "influence" adopted for the present study was the actual attendance of the caller at the scheduled session.

Four sessions were conducted in city recreation centers during the last nine days of the 19-day campaign. The centers were in different areas of the city. In addition, three respondents completed the questionnaire in other locations (two at a local high school and one in a public library).

C. RESULTS

The number of commitments to attend the formal data-collection sessions that each channel obtained is shown in Table 1. The largest number ($N = 37$) was obtained by newspapers, the least ($N = 10$) by recreation center

TABLE 1
CALLERS WHO DID AND DID NOT ATTEND: CLASSIFIED BY COMMUNICATION CHANNEL

Channel	Attendees		Nonattendees		Total	
	N	%	N	%	N	%
Newspaper	14	38	23	62	37	100
Recreation center bulletin board	9	90	1	10	10	100
High school nonpersonal	8	44	10	56	18	100
Personal	7	58	5	42	12	100
More than one	17	77	5	23	22	100
Total	55	56	44	44	99	100

Note: The "high school nonpersonal" channel includes respondents contacted at high school by public address system or by bulletin board. The two categories were combined because of the shared location and because of the small number of persons in the latter category. Telephone information concerning channel of contact was not obtained for three additional respondents; one was an attendee and two were nonattendees.

bulletin boards. The other channels, including personal contact, were intermediate. Also shown is the number of persons scheduled through each channel who, as it later turned out, actually did or did not attend the session. A chi square analysis applied to the latter data was significant ($p < .01$, $\chi^2 = 14.65$, $df = 4$), indicating that the channels produced differential rates of attendance. Interestingly, it can be seen in Table 1 that the highest

³ The questionnaires were concerned with some of the determinants, attitudinal and otherwise, of occupational planning among high school seniors. Data from these questionnaires and from others completed elsewhere will be of the subject of a separate report later.

percentage of attendance was produced by the recreation center bulletin boards (90%), and the least by newspapers (38%), which is just the opposite for number of telephone calls produced. The importance of distinguishing between different kinds of influence—in this case, agreement to attend and the later attendance itself—is pointed out clearly by these data.

The unusually high rate of attendance produced by the notices on recreation center bulletin boards probably is due to the fact that nearly all later testing also was done in recreation centers. It should be noted, however, that the majority of callers in this category (7 of the 10) were assigned to different recreation centers from those in which the notices had been observed. Familiarity with the *general* testing setting, rather than with a specific neighborhood center, thus apparently is the underlying determinant. This factor appears to outweigh even personal contact in importance.

The first three channels listed in Table 1 (newspaper, recreation center bulletin board, high school nonpersonal) were examined separately in a second chi square analysis in order to test for differential influence solely among the nonpersonal channels. The chi square was significant ($p < .05$, $\chi^2 = 8.69$, $df = 2$). The most and least influential channels, respectively, again were recreation center bulletin boards and newspapers.

A final test was made on the hypothesis that persons exposed to many sources, personal or nonpersonal, are more influenced than those exposed to only one. A chi square analysis, which compared the combination of the first four channels listed in Table 1 with the fifth ("more than one") category, was employed for this purpose. As expected, the analysis was significant ($p < .05$, $\chi^2 = 4.33$, $df = 1$). Exposure to multiple sources resulted in significantly greater attendance (77%) than did exposure to only one source (49%).

Other possible differences between attenders and nonattenders also were examined. Attenders, compared to nonattenders, tended more frequently to be white ($p < .10$) and to say that they had spoken to someone else about the research after first learning of it themselves ($p < .10$). No such differences were found with regard to the caller's sex or plans to attend college.

D. DISCUSSION

The present results reaffirm the value of Katz and Lazarsfeld's (4) distinction between influence and information. At the same time, however, the results point up certain difficulties with the concept of "influence" as subsequently used in discussions of the media's effects. First, it is obvious that even nonpersonal channels are capable of influencing an audience, and to

differing degrees. Second, in some situations it may be appropriate to distinguish between different kinds of influence, such as obtaining agreement to perform an action *versus* obtaining the actual action itself.

Rosenthal and Rosnow (6, p. 64), in their review of research on volunteering, commented that "it is just those conditions that increase the likelihood of a subject's volunteering that increase the likelihood that he will not show up when he is supposed to." The present results suggest the possibility that a somewhat similar generalization may be appropriate for certain channels of communication. For example, newspapers may have capabilities which make them particularly effective channels for disseminating information, and perhaps even for obtaining initial expressions of intention, but they do not appear very effective for producing a behavioral follow-through from the reader.

In their analysis of the persuasion process Hovland, Janis, and Kelley (2) distinguished three steps: gaining the audience's attention, its comprehension of the message, and its acceptance of the message's conclusions. Various channels of communication may be differentially effective at each of these phases (*cf.* 5). It is reasonable to assume that in the present study all subjects had successfully attended to and comprehended the basic recruitment message prior to their telephone call for an appointment. The final stage, acceptance, thus may be the most important source of the present differences. Future research on this stage appears called for, with particular attention to such possible underlying variables as differential prestige and credibility of the communication channels.

A final point should be made. Like most other field studies of the mass media, the present study does not allow one to conclude definitively that the differential effectiveness of the channels is due to intrinsic features of the channels themselves. An equally plausible conclusion could be that the observed results are due to differential selection of audiences by the different channels. These two processes, as Hovland (1, p. 1080) notes, are quite different, although both can and probably do often operate in real life situations.

REFERENCES

1. HOVLAND, C. I. Effects of the mass media of communication. In G. Lindzey (Ed.), *Handbook of Social Psychology (Vol. II)*. Reading, Mass.: Addison-Wesley, 1954.
2. HOVLAND, C. I., JANIS, I. L., & KELLEY, H. H. *Communication and Persuasion*. New Haven, Conn.: Yale Univ. Press, 1953.
3. KATZ, E. The two-step flow of communication: An up-to-date report on an hypothesis. *Public Opin. Quart.*, 1957, 21, 61-78.

4. KATZ, E., & LAZARSFELD, P. F. *Personal Influence*. Glencoe, Ill.: Free Press, 1955.
5. LIN, N. Information flow, influence flow and the decision-making process. *Journalism Quart.*, 1971, 48, 33-40, 61.
6. ROSENTHAL, R., & ROSNOW, R. L. The volunteer subject. In R. Rosenthal & R. L. Rosnow (Eds.), *Artifact in Behavioral Research*. New York: Academic Press, 1969. Pp. 59-118.
7. WEBB, E. J., CAMPBELL, D. T., SCHWARTZ, R. D., & SECHREST, L. *Unobtrusive Measures: Nonreactive Research in the Social Sciences*. Chicago: Rand McNally, 1966.
8. WEISS, W. Mass communications. *Ann. Rev. Psychol.*, 1971, 22, 309-336.

Department of Psychology

University of Maryland

College Park, Maryland 20742

TWO METHODS OF PSYCHIATRIC INTERVIEWING: TELEPHONE AND FACE-TO-FACE*

Biometrics Research, New York State Department of Mental Hygiene

ROBERT J. SIMON, JOSEPH L. FLEISS, BERNICE FISHER,
AND BARRY J. GURLAND

SUMMARY

Studied the effects of telephone and face-to-face interviews on the quantity and quality of historical information obtained from informants of psychiatric patients. Whenever possible the closest available relative of 105 consecutive admissions between the ages of 20-34 was interviewed by a social scientist using a semistructured psychiatric interview consisting of 88 questions. A total of 85 informants were interviewed, 50 face-to-face and 35 by telephone. The two groups of informants were similar in all characteristics possibly associated with knowledge of the patient and willingness to provide information. The information elicited by one method was not significantly different from the information elicited by the other in either quantity or quality. Our results indicate that the amount or quality of historical psychiatric data collected from informants was not related to the technique used.

A. INTRODUCTION

This report compares and evaluates two interviewing techniques, face-to-face and telephone. The two methods were utilized in the collection of psychiatric and family histories from the informants of hospitalized psychiatric patients. The differential effect of these techniques upon communication difficulty, and upon the quantity and quality of the information obtained, is examined in this communication.

Telephone interviewing is not a new technique. Shyne (7) reports that social caseworkers have been conducting over 50% of their casework interviews for family service by telephone since the late 1940s. Casework agencies are unanimous in regarding the telephone as more useful with collaterals

* Recommended by Joseph Zubin of the Editorial Board, received in the Editorial Office on July 17, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

than with clients, and over 90% of the contacts with collaterals have been conducted by telephone.

Prior studies comparing face-to-face and telephone techniques have yielded inconsistent results. Both Parten (4) and Selltiz *et al.* (6) report that telephone interviews must be short and superficial in order to gain interviewer cooperation.

Kegeles' (3) long distance follow-up by telephone averaged only five minutes. Shyne reported that telephone interviews by caseworkers were shorter, averaging slightly over 10 minutes, compared to face-to-face interviews which averaged slightly less than 60 minutes. A partial explanation of the time differential between these two interviewing methods is the social workers' reports that their own expectations of brevity in a face-to-face interview seemed discourteous. In contrast, Colombotos' (1) study of physicians' attitudes showed that telephone interviews need not be of short duration.

Shyne concluded that certain types of information were more suitable for collection by telephone than others. Appropriate areas for telephone interviewing were questions regarding community resources (e. g., public assistance, state employment, or housing agencies). Intra- or interpersonal problems, including information regarding psychiatric resources, were not found appropriate for telephone interviewing. Frequently, interviews involving these personal matters were not attempted without an exploratory interview. Colombotos and Kegeles *et al.* found that face-to-face and telephone interviews yielded essentially the same results on such personal matters as political and professional issues, physician's income, occupation and education of the respondent's father, and beliefs and practices about dental disease, TB, and cancer. Both concluded that the nature of the telephone interview need not be superficial. Kegeles *et al.* and Schmiedeskamp (5) reported the refusal rate of telephone reinterviewing as less than 5%, and furthermore, Kegeles' work has also shown the response rates for the telephone to quite similar to those for face-to-face.

B. METHOD

The data under analysis were collected as part of a larger psychiatric study dealing with diagnostic comparisons between New York and London by Gurland *et al.* (2).

Each of a series of 105 consecutive admissions to Brooklyn State Hospital between the ages of 20 and 34 was interviewed by a project psychiatrist using a structured mental state psychiatric schedule and a semistructured psychiatric history schedule. The closest available relative (and, on two

occasions, a nonrelative) was interviewed by a social scientist with the history schedule. This schedule consisted of 245 items. The areas covered by the interview were family history, patient's early life, education, occupational history, cultural background, sexual history, marital history, physical health in childhood, sociopathic behavior, alcohol and drug taking, previous personality, friendships, development of present illness, and previous psychiatric history.

No informant was available for nine of the 105 patients. All of the remaining 96 patients had informants who were willing to be interviewed. Eleven of these 96 cases were excluded from analysis because the informant either requested a specific mode of interview (two requested telephone and two requested face-to-face interviews) or had partial interviews by both techniques. These exclusions left 85 informants for our analyses.

Twelve of these 85 informants were interviewed face-to-face either because they had no telephone or because their presence at the hospital provided an immediate opportunity to interview them. The remaining 73 informants were contacted as follows. The interviewer telephoned them one after the other, alternating the request for a face-to-face and telephone interview with each call. Those informants not contacted on one day were added to the next day's list and appeared at the top of it. This procedure served to keep the introduction of selective bias to a minimum. Thirty-five of these informants were interviewed by telephone. The remaining 38 interviewed face-to-face after the initial telephone contact were combined with the 12 seen initially in person because no differences between the two groups were found. Together these two subgroups comprised the face-to-face sample of 50.

When approached, the informant was told that the interview was not directly involved with either hospital diagnosis, treatment, or prognosis. Rather, he was informed that the interviewer was interested in the patient's problems and was gathering this information to understand more about him. Further explanations were offered as required. At this juncture the request for the appointment was made.

There was no rigidly prepared wording of the request, but usually the format was as follows. For informants selected for the telephone interview: "Would you mind answering the questions concerning X's illness and his family background now?" For those selected for the face-to-face interview: "Could I meet with you at the hospital next visiting day to discuss X's illness and his family background?" In both approaches it was mentioned that the interview usually took under one hour.

Departures from randomness inevitably occurred, but they tended to result from scheduling difficulties. For example, if an informant was origi-

nally scheduled by the sequential alternating method to be interviewed face-to-face, but no time mutually convenient to him and the interviewer could be found, then the interview was conducted by telephone. None of the three or four departures from randomness was obviously associated with the information being sought.

In spite of the two groups of informants not being constituted strictly at random, they ended up comparable with respect to characteristics expected to be associated with the information being elicited. Specifically, the group interviewed by telephone did not differ significantly from the group interviewed face-to-face with respect to the relationship between patient and informant, the mean length of time that the relationship had existed, or the frequency of contacts during the preceding year. The patients whose informants were interviewed by telephone did not differ significantly from those whose informants were interviewed face-to-face with respect to sex, race, ethnicity, religion, education, or occupation. The patients whose informants were interviewed by telephone tended to have been hospitalized slightly more frequently and to have spent, on the average, slightly more time in the hospital than the patients whose informants were interviewed face-to-face. These differences were not, however, statistically significant.

C. RESULTS

The data were first analyzed to determine whether there were differences between the two groups in the frequency of communication difficulties as subjectively rated by the interviewer (see Table 1). The two groups were similar with respect to communication difficulties, with none of the differences in frequencies being statistically significant by the chi square criterion with Yates' correction.

The data were next analyzed in order to determine which of the two interviewing techniques furnished more information. The number of responses "I don't know" was counted for each individual within the face-to-face and telephone groups.

TABLE 1
PERCENT OF INFORMANTS WITH EACH OF FIVE TYPES OF COMMUNICATION DIFFICULTY

Communication difficulty	Face-to-Face (<i>N</i> = 50)	Telephone (<i>N</i> = 35)
Language difficulty	18	9
Low intelligence	8	11
Uncooperative or evasive	24	23
Hostility toward interview or interviewer	12	0
Refusal to continue	2	0

The 245 interview items were divided into two types. Fifty-seven items were "hard" (i. e., of a strictly factual nature, such as number of siblings and number of children). One hundred eighty-eight were "soft" (i. e., the responses were at least partially dependent upon opinion or attitude, such as mother's personality and patient's adult heterosexual behavior).

The proportions in the two groups who answered "I don't know" to at least one of the hard questions and to at least one of the soft were compared. For neither type of question was there a significant difference in the quantity of information obtained by the two methods. With respect to the hard questions 44% of the informants interviewed face-to-face *versus* 54% interviewed by telephone responded "I don't know" to at least one such question. For the soft questions the corresponding percentages were 84% and 91%. Regardless of the interviewing method, a much larger proportion of informants was unable to answer soft than hard questions.

One-fifth of the soft items were further analyzed to determine if the quality of the informants' response was affected by the mode of the interview. Specifically, the response to each question was categorized as either indicating pathology in the patient or not. In none of these items was there a significant difference between the proportion of responses indicating pathology in the face-to-face sample and the telephone sample. There was a slight, but not statistically significant, tendency across the selected soft items for there to be more reports of pathology from informants interviewed by telephone than by a face-to-face interview.

The distribution for the amount of time spent in the interview by both techniques was similar (Table 2). There was a slightly greater concentration of the shortest interviews (i. e., less than 30 minutes) in the face-to-face method, and a slightly greater concentration of the longest interviews (i. e.,

TABLE 2
LENGTH OF INFORMANT INTERVIEW (PERCENT DISTRIBUTION)

Number of minutes	Face-to-face (<i>N</i> = 50)	Telephone (<i>N</i> = 35)
15-29	6.0	—
30-34	2.0	5.7
35-39	10.0	8.6
40-44	18.0	11.4
45-49	22.0	28.6
50-54	28.0	25.7
55-59	8.0	5.7
60-69	4.0	14.3
Unknown	2.0	—
Total	100.0	100.0

over 60 minutes) in the telephone method. This result contradicts Parten's (4) and Selltiz' (6) conclusion that telephone interviewing must be brief in order to gain the respondent's cooperation.

D. DISCUSSION AND CONCLUSION

These results confirmed the finding of Colombotos (1) and Kegeles *et al.* (3) of a high rate of acceptance of a telephone interview. Approximately 5% of the informants who were requested to be interviewed by telephone refused to be interviewed in that manner. This refusal rate was, in fact, the same as that by informants for whom a face-to-face interview was requested. The findings reported here also support Colombotos and Kegeles *et al.*, who reported that face-to-face and telephone interviews yielded essentially the same data on personal material.

There is no basis from our results for concluding that the amount or quality of historical psychiatric data collected from informants is related to the technique used. What is instead evident is that the number of responses "I don't know" is more related to the type of question asked than to the mode of interviewing.

Shyne's (7) finding that an interview conducted by phone could not gather psychiatric data has not been confirmed. It is conceivable that the contrast in results between this study and Shyne's reports of social workers mirrors the attitudes of the social workers in a self-fulfilling prophecy regarding methods of interviewing and contents of interviews.

REFERENCES

1. COLOMBOTOS, J. Personal versus telephone interviews: Effect on responses. *Pub. Health Rep.*, 1969, **84**, 773-782.
2. GURLAND, B. J., FLEISS, J. L., COOPER, J. E., SHARPE, L., KENDELL, R. E., & ROBERTS, P. Cross-national study of the diagnosis of mental disorders: Hospital diagnoses and hospital patients in New York and London. *Compr. Psychiat.*, 1970, **11**, 18-25.
3. KEGELES, S. S., FINK, C. F., & KIRSCHT, J. P. Interviewing a national sample by long-distance telephone. *Pub. Opinion Quart.*, 1969, **33**, 413-420.
4. PARTEN, M. Surveys, Polls and Samples: Practical Procedures. New York: Harper, 1950. P. 87.
5. SCHMIEDESKAMP, J. W. Reinterviews by telephone. *J. Marketing*, 1962, **26**, 28-34.
6. SELLTIZ, C., JAHODA, M., DEUTSCH, M., & COOK, S. Research Methods in Social Relations. New York: Holt, Rinehart & Winston, 1961. P. 239.
7. SHYNE, A. W. Telephone interviews in casework. *Soc. Casewk.*, 1954, **35**, 342-347.

Biometrics Research

722 West 168 Street

New York, New York 10032

COGNITIVE APPRAISAL: AN EXAMINATION* ¹

Colorado State University

RICHARD I. FISHER

SUMMARY

Two hundred ninety-five college students were tested to determine the effects of specified variables of self-appraisal and task appraisal on achievement, self-assessment of achievement, and expended effort. Primary results were as follows: (a) The academic self-concept was found to contribute significantly to achievement on a specific task. Partial correlation between the academic self-concept and task achievement with intelligence controlled was .39 ($p \leq .05$). A nonsignificant partial correlation between task confidence and task achievement with intelligence controlled was .16 (considered high enough to warrant further study). (b) Approximately two-thirds of the variance in self-assessment of achievement was found to be due to one's perceived achievement on a specific task. The variables of self-appraisal (i. e., academic self-concept and self-confidence) were not found to affect self-assessment of achievement, nor the variables of task appraisal (i. e., task confidence and task interest). Expended effort appears to have had a small part in the total variance of self-assessment of achievement. (c) Expended effort was found to be significantly related to task interest, but variables of self-appraisal did not contribute significantly to expended effort.

A. INTRODUCTION

The purpose of this study was to investigate the effects of independent variables of cognitive appraisal (i. e., self-appraisal and task appraisal) on dependent variables of task achievement, self-assessment of one's achievement, and expended effort. The two self-appraisal variables were (a) the academic self-concept which is simply the image one has of oneself as a student and (b) self-confidence which is the degree of confidence or certainty one has in one's academic self-concept. There were two variables of task

* Received in the Editorial Office on July 19, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ An abridged version of a research project supported by a faculty research grant, project #817, Colorado State University.

appraisal defined as (a) task confidence or the degree of confidence in being successful at a given task and (b) task interest which is the degree of expressed interest in a given task.

Included in the above purpose are two primary objectives of the study. The first objective was to determine the extent to which self-assessment of achievement is affected by variables of self-appraisal and/or task appraisal. This was of primary concern, since Katz (2) and others have noted the importance of self-assessment of achievement in determining whether a performer will continue or discontinue with similar tasks. A second objective was to determine if there was a significant relationship between academic self-concept and expended effort. Heider (1) states that it is likely that a person believes that less effort is necessary for success at a task if he thinks of himself as very able than if he believes his ability for the task is relatively low. Whether or not this is true in terms of expended effort has never been investigated. In addition, a third primary objective of the study was to determine the effect of expended effort on self-assessment of achievement. A positive and significant relationship between these two variables has often been inferred by teachers who claim that students often assess their performance by how hard they perceive themselves as having tried rather than by an objective evaluation.

B. METHOD

The Ss for the study were recruited from classes in the Department of Education at Colorado State University. There were 295 Ss with 164 females and 131 males in the study. All were juniors or seniors.

All tests were administered so that Ss could maintain anonymity by placing a symbol on each test rather than their name. All Ss were administered a two part rating scale. Part I requested each S to rate himself on 10 questions that reflected his general academic ability. Part II of the scale, completed concurrently with Part I, required the S to rate himself as to his level of confidence that his response in Part I was correct. In other words, how confident was the S that his rating in Part I reflected his true ability, thus providing a measure of self-confidence. The scale contained such items as (a) How would you rate yourself as far as your ability to reason? (b) How would you rate yourself as far as your knowledge of vocabulary?

Reliability coefficients of the academic self-concept and self-confidence ratings were .81 and .91, respectively. Computation was based on a split halves, odd-even correlation adjusted by Spearman-Brown formula. It should be noted that all the rating scales used in this study were marked

by Ss along a linear continuum. Ss were free to mark anywhere along the line, and scoring was completed by the use of an overlay with a range of from 1 to 10.

Following the administration of the above rating scale, each *S* was presented with a word reasoning task. This task was to solve a disarranged word test consisting of 14 anagrams. The anagrams were selected from Sargent's (3) list of easy, medium, and difficult anagrams. The scores on the test (i. e., the number right) provided a measure of task achievement. All Ss were tested in groups. The time limit was 15 minutes. Before beginning the task, Ss were asked if they had any questions and if they understood the task. After all had responded affirmatively, they were asked to respond to two more rating scales. Rating scale #1 was used as an indicator of one's task confidence. The directions of the scale were as follows: "Now that you understand the task, please rate yourself in terms of how confident you are that you will do well on the task." Rating scale #2 was used as a measure of task interest. The directions were: "Please indicate on the scale below your degree of interest in this task."

Upon completion of the above two rating scales, the Ss were allowed to undertake the task. Upon completion of the task or at the end of 15 minutes, each *S* was told to stop. At this point, each *S* responded to two more rating scales. Rating scale #3 was used to provide an estimate of "how hard one tried to succeed at the task" (i. e., a measure expended effort). The directions were as follows: "Please rate yourself as to how hard you tried to succeed at this task." Rating scale #4 was designed to measure self-assessment of achievement. The directions were as follows: "Circle below the grade that you believe you should receive on this particular task."

In addition to the above testing, 87 students volunteered to complete an intelligence test. Ss received \$2.00 to take the test. The test utilized was the Henmon-Nelson test of mental ability-college form. The raw scores on the Q portion of the test were utilized.

C. RESULTS AND DISCUSSION

Since this study was concerned with factors that influence achievement, it was apparent that all variables should be examined to determine their correlation with intelligence. Self-appraisal variables did not correlate significantly with intelligence; however, both task appraisal variables of task confidence and task interest correlated .23 and .24, respectively, with intelligence scores. Both correlations were significant at the .05 level. Variables of expended effort, self-assessment of achievement, and task achievement cor-

related .18, .36, and .47, respectively, with intelligence scores (all correlations significant at the .05 level or less). It should be noted that all computations were performed on a Controlled Data 6400 computer.

TABLE 1
CORRELATION COEFFICIENTS BETWEEN INDEPENDENT AND DEPENDENT VARIABLES

Variable	Expended effort		Task achievement		Self-assessment of achievement	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Self-concept						
Total	.07	NS	.36	.001	.29	.001
Male	.14	.052	.38	.001	.34	.001
Female	.01	NS	.33	.001	.24	.001
Self-confidence						
Total	-.02	NS	.14	.008	.15	.005
Male	.04	NS	.14	.008	.15	.001
Female	-.12	NS	.19	.017	.00	NS
Task confidence						
Total	.09	NS	.41	.001	.35	.001
Male	.05	NS	.40	.001	.40	.001
Female	.12	NS	.41	.001	.28	.001
Task interest						
Total	.47	.001	.22	.001	.17	.003
Male	.46	.001	.31	.001	.21	.010
Female	.47	.001	.11	NS	.11	NS
Self-assessment						
Total	.20	.001	.80	.001		
Male	.14	.002	.79	.001		
Female	.26	.001	.80	.001		

Note: *N* = 295 (164 females and 131 males).

Table 1 contains the results of correlations between dependent and independent variables. It is clear that task achievement and self-assessment of achievement are significantly related to all four variables of cognitive appraisal. Thus a regression analysis of these two variables was performed. These data are presented in Table 2.

The general purpose of this study was to determine the effect of specified variables of cognitive appraisal on task achievement, self-assessment of achievement, and expended effort. The results indicate that these variables did not affect task achievement when intelligence was controlled, except for the variables of the academic self-concept and task confidence. Partial correlation of academic self-concept with task achievement (intelligence controlled) was .39 ($p \leq .05$). Although task confidence was not significantly correlated with task achievement (intelligence controlled), further research is indicated, since the partial correlation of .16 (Table 2) is high enough to

TABLE 2
REGRESSION ANALYSIS OF TASK ACHIEVEMENT AND SELF-ASSESSMENT OF ACHIEVEMENT

Variable	Multiple R	Simple R	B	Controlling intelligence	Controlling achievement
<i>Task achievement</i>					
Intelligence	.51	.51	.19		
Self-concept	.61	.36	.10		
Self-confidence	.61	.13	.00	.39*	
Task confidence	.61	.28	.03	.12	
Task interest	.61	.18	-.01	.16	
Constant			-.03	.06	
<i>Self-assessment of achievement</i>					
Achievement	.78	.78	.81		
Intelligence	.78	.41	-.01		
Self-concept	.78	.25	.01		.03
Self-confidence	.78	.12	.01		.05
Task confidence	.78	.20	.04		.03
Task interest	.78	.18	.02		.03
Expended effort	.79	.17	.14		.05
Constant			-.39		.13

* $p \leq .05$.

be suggestive. It may well be that with larger samples (only 87 Ss took the IQ test) the correlation will increase, or perhaps increases will occur with more sophisticated means of measuring the variables involved.

The first objective of this study was to determine the extent to which self-assessment of achievement is affected by variables of cognitive appraisal. The results reveal that there is no relationship between these variables. The correlation in Table 1 between self-assessment of achievement and all four of the variables of cognitive appraisal is more likely a result of their common correlation with task achievement (Table 2). From Table 2 it is evident that the primary contributor (approximately 64% of the variance) to self-assessment of achievement is task achievement. This, of course, is opposed to the commonly held conviction that self-assessment is primarily the result of "feedback" from others.

The second objective, to determine the relationship between academic self-concept and expended effort, was examined. The results show that there was no significant relationship between these variables. Heider's statement that it is likely that a person believes that less effort is necessary for success at a task if he thinks of himself as very able than if he believes his ability for the task is relatively low does not seem to hold in terms of expended effort. There was no significant correlation between expended effort and academic self-concept except in the case of males. Additional examination of the data showed no significant differences between the level of expended

effort for high self-concept Ss (self-concepts at or above 85th percentile) and low self-concept Ss (self-concepts at or below 15th percentile).

The third objective of determining the effects of expended effort on self-assessment of achievement was determined (Table 1). The results are not conclusive, since it appears that expended effort or how hard one perceives himself as having tried does significantly correlate with self-assessment of achievement, but Table 2 shows a nonsignificant partial correlation with self-assessment of achievement when achievement is controlled. Further research is recommended to determine if students actually expended effort in their self-assessment of achievement, and if there is a sex difference in relation to this tendency.

REFERENCES

1. HEIDER, F. *The Psychology of Interpersonal Relations*. New York: Wiley, 1958.
2. KATZ, I. Academic motivation and equal educational opportunity. *Harvard Educ. Rev.*, 1968, **38**, 57-65.
3. SARGENT, S. Thinking processes of various levels of difficulty. *Arch. Psychol.*, 1940, **249**, 249-281.

Department of Education
Colorado State University
Fort Collins, Colorado 80521

SES DIFFERENCES IN EFFECTS OF BRIEF SOCIAL SATIATION*¹

Duke University²

ELISHA Y. BABAD

SUMMARY

Two previous studies which supported a cognitive interpretation of the social deprivation-satiation effect with middle class children were replicated with lower class Ss. In the first experiment 40 middle class and 40 lower class children were given a social deprivation or a satiation treatment, followed by a binary discrimination test, given either by the same or by another *E*. In the second experiment, 74 middle class and 74 lower class Ss were given information about their *E*'s "reinforcing habits" prior to the treatment. In that experiment both treatment and test were given by the same *E*. The findings for the middle class samples were as follows: the deprivation-satiation effect was person-specific, not generalizable from one *E* to another; the informational input caused a deprivation-satiation like effect and modified the effect of actual treatments on subsequent performance. The lower class children reacted mostly to the most immediate, salient, and concrete aspects of the situation. The intangible reinforcing stimulus word *Good* was an effective reinforcer for them, but only a non-significant trend toward a deprivation-satiation effect was observed, with no person-specificity. The informational input had no effect on the performance of the lower class children.

A. INTRODUCTION

Differences between middle and lower class children in various areas of social learning have been reported [see, for example, Zigler and Kanzer (25), Zigler and deLarby (24), Hess and Shipman (13), Rotter (22), and Mischel (19)]. In this investigation we propose to deal with SES differences

* Received in the Editorial Office on July 19, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The author wishes to thank Norman Guttman, Charles Greenbaum, and Barbara Wasik for their helpful comments, and Yael Babad for her help in data collection and analysis. The research was supported by the Duke University Biomedical Sciences Committee.

² The author is now at the Hebrew University of Jerusalem, Israel.

in effects of brief social deprivation and satiation and, particularly, with the person-specificity of the deprivation-satiation phenomenon and the effects of informational input on performance. In this study, two of Babad's (2, 3) experiments on middle class children are replicated with underprivileged Ss, in an attempt to expose SES differences.

Gewirtz (9, 10) described the social deprivation-satiation effect as the inverse relation between the frequency of social stimulus presentations and the efficacy of this stimulus in a reinforcing role. The less available the stimulus word *Good* was in a standard treatment period, the more effective it became in reinforcing responses on a subsequent simple binary discrimination task.

In the Gewirtz studies (9, 10, 11, 12, 15) the emphasis was placed on *stimuli* in their various roles and, particularly, on the effects of manipulating their availability to the individual. Babad (1) attempted to explicate some of the cognitive mechanisms that mediate this effect. His conceptualization is in line with Jones and Davis' (14) ideas regarding interaction contingencies and the attribution of intention. In Babad's interpretation the focus is on the child's perspective of his interaction with the experimenter, where the experimenter is perceived as the *source* of reinforcing stimuli. During the treatment period, the child derives information about the experimenter and forms in his mind an idea of that experimenter's reinforcement value, which leads to his subsequent behavior on the learning task.

A "satiating" experimenter emits social stimuli at such a high rate that it is impossible for the child to identify what there is in *his own* behavior that triggers such an overflow. The child therefore reaches the conclusion that it is something in the experimenter's nature that makes him emit these stimuli. Since the child lacks the sense of contingency between behavior and reinforcement, the experimenter's reinforcement carries but little potential for changing his behavior. A "depriving" experimenter, on the other hand, facilitates the impression that his nature is to *not* reinforce, and his infrequent emissions of social stimulus are inferred by the child to be contingent upon a particular action of his own. (The actual frequency in a deprivation treatment is too low to allow the child actually to test the contingencies.) This experimenter's social reinforcement thus acquires a high potential of influencing the child's behavior. In both cases reinforcement value is based on the previous child-experimenter interaction and is determined by the perceived contingencies of that interaction.

Other interpretations [see Eisenberger (6)] also focus on the perceived meaning of the child-experimenter interaction. Cairns (5) discussed depriva-

tion-satiation in terms of alterations in subjects' attention elicited by expectations of "systematic" or "unsystematic" approval-contingent performance. McArthur and Zigler (17) analyzed the child-experimenter interaction in terms of valence and children's positive and negative reaction tendencies.

Babad conducted two experiments to test his conceptualization, both of which utilized middle class third graders as Ss. In the first study (2) he found the deprivation-satiation effect to be person-specific, not readily generalizable from one experimenter to another. The difference in discrimination-test performance between deprivation and satiation groups dropped sharply when the test was not administered by the treating experimenter. In the second study (3) children received information about the experimenter's reinforcement habit prior to actual deprivation or satiation treatments. This informational input was designed to parallel the information assumed to be derived by the children from actual treatments. Babad found that a deprivation-satiation like effect was produced by informational input alone, and that the information interacted with, and modified, the effects of the actual treatments on subsequent performance. In the present study, these experiments are replicated with lower class children, and both sets of data will be used in determining SES differences.

The research literature on SES differences in social learning is quite extensive. Availability of various types of reinforcement in the home environment and its implications for later social learning were studied by Gewirtz (8), Zigler and his associates (e. g., 26), Hess and Shipman (13), and Rosenhan (20). Differences between middle class and lower class children were found in their readiness to delay gratification (19) and in their tendencies to expect internal or external control of reward (4, 16). As to the nature of the reinforcing stimuli in learning tasks, SES differences were found (7, 23, 24) in efficacy of tangible and intangible reinforcers, the former being more effective with lower class children. Zigler and Kanzer (25) further differentiated intangible reinforcers into correctness stimuli and praise stimuli, reporting the former more effective with middle class children and the latter more effective with underprivileged children. However, other researchers (18, 20, 21) failed to replicate Zigler and Kanzer's findings.

Given the assumed differences between middle class and lower class children in socialization and reinforcement history, and given that the word *Good* represents an intangible reinforcer, our investigation of SES differences focused on the following questions:

1. Would the stimulus word *Good* affect the performance of the lower class children?

2. Would the experimental treatments (varying the number of *Good* presentations during a set period) cause a typical deprivation-satiation effect for the lower class sample?

3. Would this deprivation-satiation effect be person-specific?

4. Would the informational input affect the performance of the lower class children?

In all cases, performance patterns of lower class children were compared to those of middle class children.

B. METHOD

1. Subjects

Ss were 188 children in third-grade classes of four North Carolina schools. Half of the Ss came from middle and upper-middle class homes and were students in two private day schools. The other half of the sample consisted of black, underprivileged children in two inner city schools. Ages ranged from 8.0 to 10.5 years. The number of Ss in each experimental group ranged from seven to 10, and sex was balanced across the groups.

Es were four psychology students. They were aware of the intent of the study, but were given no information as to the specific experimental group any subject belonged to.

2. Overview of Experimental Conditions

Study I was designed as a two-factor, 2×2 experiment, with Treatment (deprivation or satiation) and Experimenter (same *E* treating and testing, or switching *Es* between treatment and test) as the independent variables. Social class constituted a third factor, completing a $2 \times 2 \times 2$ design. Ss were 40 middle class and 40 lower class children.

Study II was also designed as a two-factor experiment, with Informational input ("few" or "many") and actual Treatment (deprivation or satiation) as the independent variables. A control level was added to each factor (no-treatment and no-information conditions), adding a fifth control group to the four experimental groups, and yielding a nine-group 3×3 design. (The same *E* groups of Study I constituted the no-information control groups in Study II.) As in the first study, social class constituted a third factor, completing a $3 \times 3 \times 2$ design. Ss were 74 middle class and 74 lower class children.

In both studies, the dependent variable was the number of "correct" (reinforced) responses in the 75-item binary discrimination test.

3. Procedure

a. Study I. Each subject was taken by *E* from the classroom and brought to the experimental room (a vacant office), where he was seated at a table facing the wall. On the table were several books and magazines and a pack of orange cards. *E* said: "I want to show you a game with these cards, but first I have to finish some paperwork. You can read these books and magazines while I work." During the next 10 minutes *E* pretended to be busy with paperwork, but emitted the stimulus word *Good* a given number of times at set intervals. In deprivation treatment the stimulus word was emitted twice during the 10-minute period. In satiation treatment the word was emitted either 16 or 20 times. (For the middle class groups in Study I satiation consisted of 16 stimuli. To increase *Es'* convenience in timing their responses, this number was later changed to 20. This change was based on Gewirtz's finding (9), which showed that groups receiving 16 or more stimulus presentations showed asymptotic low performance.) Care was taken that emission would not be contingent upon any specific activity of *S* (such as turning a page), and *E* voiced the word *Good* in a slightly impersonal manner, avoiding eye contact with *S*.

After the 10-minute treatment was over, *E* stood up and collected her papers. In the other *E* condition, *E* said: "I must finish my paperwork, but since it takes so much time and I hate to keep you waiting, I shall call someone else to show you the game with the cards." *E* then left the room, and a few seconds later another *E* entered the room and administered the discrimination test to *S*. In the same *E* condition, *E* said: "I shall go out for a minute and then return and show you the game with the cards. Please sit here and wait." *E* then left the room, re-entered a few seconds later, and administered the test.

Seventy-eight orange cards were used in the test, two pictures on each. The pictures showed (in randomized positions) one plant and one animal. The instructions were as follows: "On each card you will find two pictures. I want you to choose one of them, and point to the one you chose. O.K.? Let's start." The first three cards were used to determine *S's* preferred choice, and the picture chosen in the minority of these trials (plant or animal) was reinforced with *Good* from the fourth trial on. The maximum number of correct responses reinforced by *E* was 75.

b. Study II. *Ss* were told by their teachers that they would be seen individually by a person from Duke University who was interested in children's games. In all information groups the teachers added: "Before you go, I want

to tell you something about what will happen. The lady will show you a game with cards. The cards have pictures on them, and she will show you what to do with the pictures. I also want to tell you something about the lady. [Few condition] She may say *Good* during the game, but she usually says it only a very few times. Do *not* expect her to say *Good* many times. [Many condition] She usually says *Good* during the game, and she says it many, many times. You can expect her to say *Good* many, many times." (Each teacher gave only one kind of information to her class.)

Each child was brought individually to the testing room. The person who accompanied the child (never his *E*) repeated the information given by the teacher and made sure it was well remembered. Once in the room, each child was given the treatment and the test as described above, all by the same *E*. The no-information groups were not given any information by their teachers, while the no-treatment groups were tested immediately as they entered the room.

C. RESULTS

1. Study I

The number of "correct" responses in the 75-trial test for the four experimental groups in both SES groups was subjected to an analysis of variance. The results of the $2 \times 2 \times 2$ analysis show a significant Treatment (deprivation-satiation) effect ($F_{1,72} = 10.3, p < .002$), an Experimenter effect (same-other) approaching significance ($F_{1,72} = 3.5, p < .07$), and a significant SES \times Experimenter interaction effect ($F_{1,72} = 11.3, p < .002$). The pattern of the results is shown in Figure 1. A consideration of the separate middle class and lower class analyses of variance further explicates these results. For the middle class sample, Babad (2) reported that both Treatment and Experimenter effects, as well as the effect of their interaction, were statistically significant ($p < .05$). A similar analysis for the lower class sample yielded no significant effects.

Thus, a significant deprivation-satiation effect was found only for the middle class sample. For the same *E* condition in the middle class sample, we found a 26-point difference between the deprivation and the satiation groups. This difference dropped to less than 3 points when the children were not tested by the treating *E*. Person-specificity was further indicated by the significant interaction effect, reflecting the difference between the slopes of the same and other *E* conditions. In the lower class sample, there was a weak tendency toward a deprivation-satiation effect, but it did not reach statistical

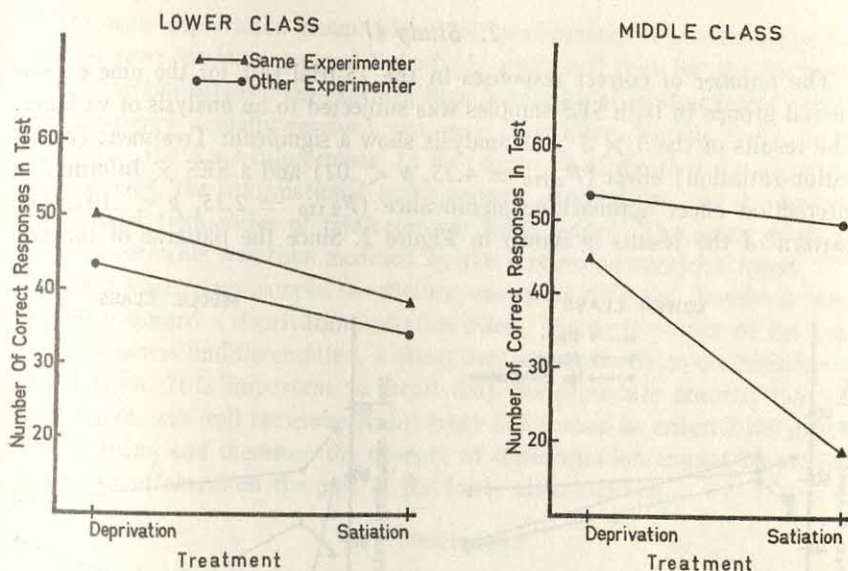


FIGURE 1
MEAN NUMBER OF CORRECT RESPONSES FOR MIDDLE CLASS AND LOWER CLASS DEPRIVATION AND SATIATION GROUPS TESTED EITHER BY THE SAME OR ANOTHER EXPERIMENTER (STUDY I)

significance, and the difference between deprivation and satiation groups in the same *E* condition was only 11.3 points. No person-specificity was indicated, the difference between the deprivation and satiation groups in the other *E* condition was 9 points, and the same *E* and other *E* slopes were almost parallel.

The introduction of a new *E* affected each SES group quite differently. While the performance of the middle class children increased with the entrance of the new *E*, this picture was reversed in the lower class sample, where performance for the new *E* was lower than performance for the familiar *E*.

Although no deprivation-satiation effect nor person-specificity was found for the lower class sample, these results cannot be attributed to the inefficacy of the reinforcer used. On the contrary, the intangible reinforcer *Good* was quite effective in influencing all lower class groups, and their mean number of correct responses was way above chance level, often exceeding the mean of the equivalent middle class group.

2. Study II

The number of correct responses in the 75-trial test for the nine experimental groups in both SES samples was subjected to an analysis of variance. The results of the $3 \times 3 \times 2$ analysis show a significant Treatment (deprivation-satiation) effect ($F_{2,170} = 4.25, p < .02$) and a SES \times Information interaction effect approaching significance ($F_{2,170} = 2.35, p < .10$). The pattern of the results is shown in Figure 2. Since the patterns of the two

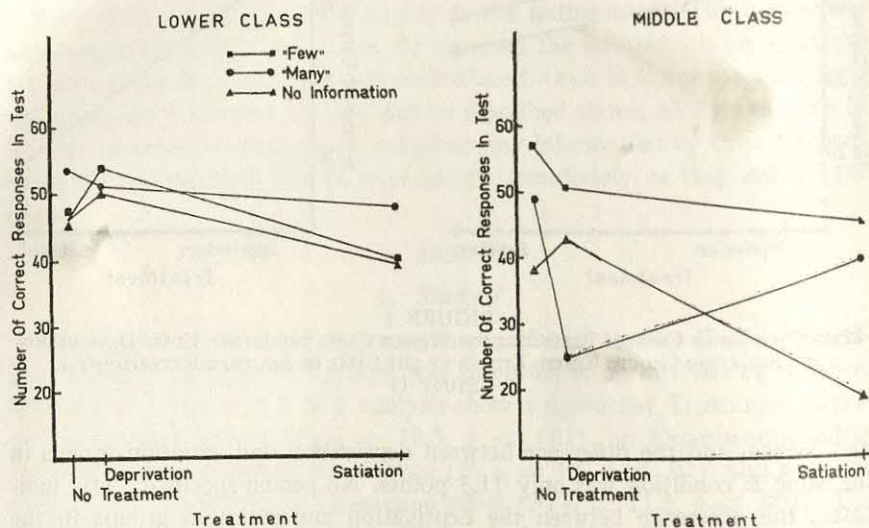


FIGURE 2

MEAN NUMBER OF CORRECT RESPONSES FOR MIDDLE CLASS AND LOWER CLASS GROUPS IN THREE INFORMATION CONDITIONS AND THREE TREATMENT CONDITIONS (STUDY II)

SES groups were so different, we must consider separately the results for the middle class and the lower class. For the middle class sample, Babad (3) reported significant ($p < .05$) effects for both Information and Treatment, as well as a significant Information \times Treatment interaction effect. A similar analysis for the lower class sample yielded only a Treatment effect approaching significance ($p < .08$), but no significant Information or Information \times Treatment interaction effect.

For the middle class sample, both informational input and the actual treatments independently caused deprivation-satiation like effects, but, at the same time, the effect of the actual treatments was influenced by the preceding informational input. This interaction is most apparent in the case

of the many-deprivation group, whose test performance was even lower than that of most satiation groups. Babad (3) explained that for the Ss in this group, the gap between the expected high frequency of reinforcement and the low frequency actually received was very frustrating, leading them to lose interest in the *E*'s reinforcement. In any event, it seems that for all middle class groups, the informational input formed expectations, on the basis of which later frequencies of reinforcement were judged. The *meaning* of the actual treatments was thus modified by the preceding cognitive input.

In the lower class sample the picture was quite different. Besides a weak tendency toward a deprivation-satiation effect, the performance of the various groups was undifferentiated, without any apparent effects of the informational input. It is important to recall that the procedure ensured that the information was well remembered by every child when he entered the experimental room, and therefore the absence of differentiation cannot be attributed to forgetfulness on the part of the lower class children.

D. DISCUSSION

The results showed consistent differences between middle class and lower class children in all aspects of the two studies. Although the stimulus word *Good* is an intangible reinforcer, it influenced the performance of both SES groups to almost the same intensity. In actual fact, the number of responses elicited by that reinforcer in the lower class sample even tended to be somewhat higher than in the middle class sample. This is in contrast with previously reported research on intangible reinforcers, and in any event it shows that the stimulus word *Good* indeed served as an effective reinforcer in both groups. However, while the deprivation and satiation treatments (same *E* groups) caused a clear deprivation-satiation effect in the middle class sample, their impact on the lower class children was less distinct, causing only a nonsignificant trend toward such effect.

The absence of a deprivation-satiation effect in the lower class sample cannot be attributed to the inefficacy of the reinforcer used. Rather, it seems that these children were not sensitive to the procedures of the treatment period, but reacted most strongly (by making more correct responses) to the many reinforcements available in the test itself. It is conceivable that the experimental treatment did not constitute social satiation for these children in the same way as it did for middle class children, while at the same time their existing need for social reinforcement was far greater than that of the middle class children. The cover story of the treatment period might have been accepted at face value, and the reinforcing stimulus emissions in the

treatment situation as too insignificant (especially in light of the pre-existing high need) to cause the formation of firm expectations. Evidence for this line of thinking is found in the high mean (46.2) of the lower class control group (no treatment/no information), as compared to the lower mean (39.1) of the same group in the middle class sample.

Since no deprivation-satiation effect was found for the lower class sample, no person-specificity could have been expected. However, one should note that in spite of the marked trend toward a deprivation-satiation effect for the same *E* lower class groups, there was no hint of person-specificity, and the two slopes were almost parallel. Here, too, one cannot claim that the switch in experimenters went unnoticed, since both SES groups reacted to the switch by altering their performance (middle class children with increased performance and lower class children with decreased performance). We must conclude that the introduction of a new *E* did not affect the behavior of lower class children as predicted by the person-specificity hypothesis. Babad (1) explained this in terms of lower class children's feelings of strangeness and anxiety in the unfamiliar situation. In any event, the person-specificity findings indicate that the switch in *E* had quite a different meaning for the two SES groups.

The results of Study II further show the consistency of the SES differences. The informational input had strong effects—direct and indirect—on test performance of middle class children, but no effects on that of lower class children, who showed an undifferentiated pattern. Although all children remembered the information when they entered the experimental room, this information did not seem to influence the reactions of the lower class children to the experimental situation.

The lower class findings of both studies can be summarized in the following sequence of intensity:

1. These children reacted most strongly to the immediate reinforcing event (i. e., the reinforcement received in the test itself).
2. Actually received—but more remote—reinforcement (i. e., reinforcing stimuli presented at the treatment phase) had a much weaker effect.
3. Other, more subtle experimental conditions (such as switching *E*s and providing informational input about the *E*'s "nature") did not cause a differentiated effect at all. Babad (1) directly manipulated remote and immediate treatments and also found lower class children to be influenced mostly by the immediate or recent event.

Quite possibly the difference between two and 20 stimuli emitted during the waiting period was insignificant for the underprivileged children and did

not cause the formation of distinct expectations. The children might have accepted the situation at face value, attaching no significance or generalized meaning to the *E*'s behavior. It is also quite possible that 20 stimuli do not constitute "satiation" for the underprivileged children. If that is the case, no deprivation-satiation effect could be expected, but rather a more uniform high level of performance for all lower class groups.

The major conclusion from the SES comparisons is that the social deprivation-satiation effect must be restricted to given populations of children and cannot be assumed to hold true for all groups. Although the present data do not bear out the belief that the deprivation-satiation phenomenon is general, those who do believe in its generality can claim that positive empirical evidence for lower class children will be found when other *E*s (more familiar to these children) or other reinforcing stimuli will be used. Until then, however, the conventional Gewirtz paradigm—and the cognitive interactive interpretation suggested to account for it—must stand qualified as applicable to middle class children.

The middle class data support Babad's (1) conceptualization. The question whether the lower class data contradict that conceptualization, necessitating a search for a different conception, must be answered in the negative: The lower class children did not manifest a clear deprivation-satiation effect, and thus the proposed conception is irrelevant to their experiences. Since these children reacted mostly to the more concrete and immediate aspects of the situation, and since the treatments did not constitute "satiation," there was no room for the formation of expectations of reinforcement value or other mechanisms which purport to mediate the social deprivation-satiation effect.

REFERENCES

1. BABAD, E. Y. A cognitive analysis of the "Social Deprivation-Satiation Effect." Unpublished Doctoral dissertation, Duke University, Durham, North Carolina, 1970.
2. ———. Person specificity of the "Social Deprivation-Satiation Effect." *Devel. Psychol.*, 1972, 6, 210-213.
3. ———. Effects of informational input on the "Social Deprivation-Satiation Effect." *J. Personal. & Soc. Psychol.*, 1973, 27, 1-5.
4. BATTLE, E. S., & ROTTER, J. B. Children's feelings of personal control as related to social class and ethnic group. *J. Personal.*, 1963, 31, 482-490.
5. CAIRNS, R. B. Antecedents of social reinforcer effectiveness. Unpublished manuscript, Indiana University, Bloomington, 1962.
6. EISENBERGER, R. Is there a deprivation-satiation function for social approval? *Psychol. Bull.*, 1970, 74, 255-275.
7. ENDO, G. T. Social drive or arousal: A test of two theories of social isolation. *J. Exper. Child Psychol.*, 1968, 6, 61-74.

8. GEWIRTZ, J. L. A learning analysis of the effects of normal stimulation, privation and deprivation on the acquisition of social motivation and attachment. In B. M. Foss (Ed.), *Determinants of Infant Behavior*. London: Methuen, 1961. Pp. 213-299.
9. ———. Deprivation and satiation of social stimuli as determinants of their reinforcing efficacy. In J. P. Hill (Ed.), *Minnesota Symposia on Child Psychology (Vol. 1)*. Minneapolis: Univ. Minnesota Press, 1967, Pp. 3-56.
10. ———. Potency of social reinforcer as a function of satiation and recovery. *Devel. Psychol.*, 1969, 1, 2-13.
11. GEWIRTZ, J. L., & BAER, D. M. The effect of brief social deprivation on behaviors for a social reinforcer. *J. Abn. & Soc. Psychol.*, 1958, 56, 49-56.
12. ———. Deprivation and satiation of social reinforcers as drive conditions. *J. Abn. & Soc. Psychol.*, 1958, 57, 165-172.
13. HESS, R. D., & SHIPMAN, V. Early experience and the socialization of cognitive modes in children. *Child Devel.*, 1965, 36, 869-886.
14. JONES, E. E., & DAVIS, K. E. From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology (Vol. 2)*. New York: Academic Press, 1965. Pp. 219-266.
15. LANDAU, R., & GEWIRTZ, J. L. Differential satiation for social reinforcing stimulus as a determinant of its efficacy in conditioning. *J. Exper. Child Psychol.*, 1967, 5, 391-405.
16. LEFCOURT, H. M., & LADWIG, G. W. The American Negro: A problem in expectations. *J. Personal. & Soc. Psychol.*, 1965, 1, 377-380.
17. MCARTHUR, L. A., & ZIGLER, E. Levels of satiation on social reinforcers and valence of the reinforcing agent as determinants of social reinforcer effectiveness. *Devel. Psychol.*, 1969, 1, 739-746.
18. McGRADE, B. J. Effectiveness of verbal reinforcers in relation to age and social class. *J. Personal. & Soc. Psychol.*, 1966, 4, 555-560.
19. MISCHEL, W. Theory and research on antecedents of self-imposed delay of reward. In B. A. Maher (Ed.), *Progress in Experimental Personality Research (Vol. 3)*. New York: Academic Press, 1966.
20. ROSENHAN, D. L. Effects of social class and race on responsiveness to approval and disapproval. *J. Personal. & Soc. Psychol.*, 1966, 4, 253-259.
21. ROSENHAN, D. L., & GREENWALD, J. E. The effects of age, sex and socioeconomic class on responsiveness to two classes of verbal reinforcement. *J. Personal.*, 1965, 33, 108-121.
22. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, 80, Whole No. 609.
23. TERRELL, G., DURKIN, K., & WISLEY, M. Social class and the nature of the incentive in discrimination learning. *J. Abn. & Soc. Psychol.*, 1959, 59, 270-273.
24. ZIGLER, E., & DELARBY, J. Concept switching in middle class, lower class and retarded children. *J. Abn. & Soc. Psychol.*, 1962, 65, 267-273.
25. ZIGLER, E., & KANZER, P. The effectiveness of two classes of verbal reinforcers on the performance of normal and feeble-minded children. *J. Personal.*, 1962, 30, 157-163.
26. ZIGLER, E., & WILLIAMS, J. Institutionalization and the effectiveness of social reinforcement: A three year follow up study. *J. Abn. & Soc. Psychol.*, 1963, 66, 197-205.

School of Education

The Hebrew University of Jerusalem

Jerusalem, Israel

ABBREVIATIONS OF WORDS USED IN THE TITLES OF JOURNALS

(One-word titles are never abbreviated. The word "the" is not used, nor its equivalent in any other language. The word "of" or its equivalent in other languages is used only to discriminate what would otherwise be identical titles in different languages. The word "and" is always used, but indicated by "&" in the Roman alphabet. Only English words are indicated here, but the corresponding words in other languages should receive a corresponding abbreviation. All abbreviations and all one-word titles should be in italics.)

Abnormal	<i>Abn.</i>	Japanese	<i>Jap.</i>
Abstracts	<i>Abst.</i>	Journal	<i>J.</i>
American	<i>Amer.</i>	Mathematical	<i>Math.</i>
Anatomy	<i>Anat.</i>	Measurement	<i>Meas.</i>
Animal	<i>Anim.</i>	Medical	<i>Med.</i>
Applied	<i>Appl.</i>	Mental	<i>Ment.</i>
Archives	<i>Arch.</i>	Monographs	<i>Monog.</i>
Association	<i>Assoc.</i>	Neurology	<i>Neurol.</i>
Attitude	<i>Attit.</i>	Opinion	<i>Opin.</i>
Australian	<i>Aust.</i>	Orthopsychiatry	<i>Orthopsychiat.</i>
Behavior	<i>Behav.</i>	Personality	<i>Personal.</i>
British	<i>Brit.</i>	Personnel	<i>Person.</i>
Bulletin	<i>Bull.</i>	Philosophy	<i>Philos.</i>
Bureau	<i>Bur.</i>	Physics	<i>Phys.</i>
Canadian	<i>Can.</i>	Physiology	<i>Physiol.</i>
Character	<i>Charac.</i>	Proceedings	<i>Proc.</i>
Children	<i>Child.</i>	Psychiatry	<i>Psychiat.</i>
Chinese	<i>Chin.</i>	Psychoanalysis	<i>Psychoanal.</i>
Clinical	<i>Clin.</i>	Psychology	<i>Psychol.</i>
College	<i>Coll.</i>	Psychosomatic	<i>Psychosomat.</i>
Comparative	<i>Comp.</i>	Quarterly	<i>Quart.</i>
Consulting	<i>Consult.</i>	Religious	<i>Relig.</i>
Contributions	<i>Contrib.</i>	Research	<i>Res.</i>
Development	<i>Devel.</i>	Review	<i>Rev.</i>
Educational	<i>Educ.</i>	School	<i>Sch.</i>
Experimental	<i>Exper.</i>	Science	<i>Sci.</i>
General	<i>Gen.</i>	Social	<i>Soc.</i>
Genetic	<i>Genet.</i>	Statistics	<i>Stat.</i>
Indian	<i>Ind.</i>	Studies	<i>Stud.</i>
Industrial	<i>Indus.</i>	Teacher	<i>Teach.</i>
International	<i>Internat.</i>	University	<i>Univ.</i>
Italian	<i>Ital.</i>		

Preparation of Manuscripts for The Journal Press

GENERAL INSTRUCTIONS

1. The proper sequence for the parts of your submitted manuscript is as follows: (a) text, (b) references, (c) footnotes, (d) tables, (e) figures, and (f) figure legends. However, monographs start with a table of contents and may have an acknowledgment page before the text and an appendix immediately after the text.
2. Use heavy typewriter paper, $8\frac{1}{2} \times 11$ inches, double-space all lines, and leave margins for editorial work. Do not use onionskin, odd sizes, and abrasive or wax finishes.
3. Submit original typewritten version and one copy. Retain second copy for proofing.
4. Retype any page on which written corrections have been made.
5. Do not begin a sentence with a numeral.
6. A summary at the beginning of the text is required for articles over 500 words.
7. Each quotation should indicate the page number of the original source. The original publisher must give permission for lengthy quotations and use of tables or figures.
8. Do not fold your manuscript.
9. Enclose a submission letter, with a statement that the manuscript is not under consideration elsewhere. If you are unknown to the Editors, kindly give your credentials.

FORMAT AND SPECIFIC INSTRUCTIONS

A. TEXT DIVISIONS

I. THE TITLES OF JOURNAL ARTICLES AND THE MAJOR SUBDIVISIONS OF MONOGRAPHS ARE PRINTED IN TEN-POINT CAPS CENTERED ON THE PAGE

- THE NEXT SUBDIVISION TITLE IS PRINTED IN CAPS AND SMALL CAPS CENTERED ON THE PAGE
1. *Then italics, with Principal Words, Upper and Lower Case, Centered on the Page*
 - a. *Then italics, upper and lower case, 1-em run-in side head.*
 - (1). *Then italics, upper and lower case, 2-em run-in side head.*
 - (a). *Then italics, upper and lower case, 3-em run-in side head.*
- [Further subdivision should be merged into the text without marginal indentation, and should be numbered with small letters.]

B. REFERENCES

- References should be arranged in alphabetical order by author, numbered and referred to in the text by number (2). Double-space!
- The proper form of a book reference is as follows:
- DOE, J. The Preparation of Manuscripts. New York: Holt, 1963. Pp. 400-418.
- The proper form of a journal reference is as follows:
- DOE, J. The preparation of manuscripts. *J. Gen. Psychol.*, 1963, 68, 450-462.
- If in the text it is desirable to refer to a page, thus (2, p. 45).

C. FOOTNOTES

- Use as few as possible and number consecutively in the text thus.¹
- ¹ Footnote (on the separate footnote page). Double-space!

D. TABLES

- Each table should be typed on a separate sheet and should be Arabic numbered (Table 2). Each column requires a heading. Vertical lines should be avoided. Mention tables consecutively in the text and indicate approximate insertion points.

E. FIGURES

- Figures should be submitted as glossy prints of the approximate size for final reproduction (ordinarily $4\frac{1}{2}$ inches in width). Lettering and lines should be sharp and clean. Figures should be Arabic numbered (Figure 2) in the text, and have consecutive mention and approximate insertion points. Each figure requires a legend, but all legends should be submitted double-spaced on a separate Figure Legends page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication

November, 1974
Volume 88, Second Half

Founded in 1935 by Carl Murchison

The Journal of PSYCHOLOGY

The General Field of Psychology

POWELL MURCHISON
Managing Editor

HELEN M. DAVIS
Associate Editor

Editorial Board

JOHN A. ANTOINETTI
Life Insurance Agency
Management Association

S. HOWARD BARTLEY
Michigan State University

IRVIN L. CHILD
Yale University

LEONARD W. DOOB
Yale University

CHARLES K. FERGUSON
University of California,
Los Angeles

FRANK R. GELDARD
Princeton University

GEORGE M. GUTHRIE
Pennsylvania State
University

NEST R. HILGARD
Stanford University

JOHN E. HORROCKS
Ohio State University

If this space be unstamped, this is the regular library edition.
But if this space is stamped with a designating title, this is a special
edition, sold under the restrictions of a bilateral contract, and may not
be resold for a period of five years from date of publication.

DAVID HOTHERSALL
Ohio State University

DARWIN P. HUNT
New Mexico State
University

J. McV. HUNT
University of Illinois

JEROME KAGAN
Harvard University

HEINRICH KLÜVER
University of Chicago

NORMAN L. MUNN
University of Adelaide,
Australia

ARTHUR J. RIOPELLE
Louisiana State University

WARREN H. TEICHNER
New Mexico State
University

JOSEPH ZUBIN
Psychiatric Institute,
Columbia University

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass.
and additional mailing offices

all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 02657

Microfiche Now Available

Back Issues

While continuing to maintain a complete inventory of paper-bound back issues for all five journals—some reprinted and some original editions—The Journal Press is now offering microfiche (negative silverfiche) versions for all but the last two calendar years: i.e., Volume 1 through 1970 volumes are available immediately; 1971 volumes will first be available in January 1974; 1972 volumes, in January 1975, etc. The minimum order is for one volume. The following rates are in effect: Paper-bound—single numbers, \$9.00; microfiche, not available. Paper-bound—two-part volumes, \$18.00; microfiche, \$6.00. Paper-bound—three-part volumes, \$27.00; microfiche, \$9.00. Paper-bound—four-part and over-four-part volumes, \$36.00; microfiche, \$12.00. The only exceptions (special issues) are starred below.*

VOLUMES	DATES	PRICE PER VOLUME		PRICE THROUGH 1970	
		PAPER	MICRO-FICHE	PAPER	MICRO-FICHE
<i>Journal of Genetic Psychology</i> (Pedagogical Seminary)					
1-117	1891-1970			\$2754.00	\$895.00
1-4	1891-April 1897	\$27.00	\$ 9.00		
5-37	July 1897-1930	36.00	12.00		
38*	1930	18.00	6.00		
39	1931	36.00	12.00		
40 and later	1932-	18.00	6.00		
<i>Genetic Psychology Monographs</i>					
1-82	1926-1970			1872.00	620.00
1-22	1926-1940	36.00	12.00		
23 and later	1941-	18.00	6.00		
<i>Journal of General Psychology</i>					
1-83	1928-1970			1566.00	520.00
1-3	1928-1930	36.00	12.00		
4*	1930	18.00	6.00		
5	1931	36.00	12.00		
6 and later	1932-	18.00	6.00		
<i>Journal of Social Psychology</i>					
1-82	1930-1970			1656.00	550.00
1-10	1930-1939	36.00	12.00		
11 and later	1940-	18.00	6.00		
<i>Journal of Psychology</i>					
1-76	1935/36-1970			1368.00	450.00
1 and later	1935/36-	18.00	6.00		

A mailing charge of \$0.30 per volume is made for foreign delivery of paper editions. Domestic paper mailings carry no postage charge. Prepaid foreign and domestic microfiche orders are also postage free; other orders will be billed for costs. Remittances should be by check or money order payable in U.S. funds on a United States bank, with no bank commission deducted. Advance payment is required from all individuals and from foreign purchasers. Microfilm versions and special bindings are not available.

Microfiche orders only may be sent directly to The Journal Press or to Johnson Associates Inc., 175 Fifth Avenue, New York, New York 10010.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

32

Notice: All copyrighted material reprinted or otherwise reproduced from Journal Press publications should be given an appropriate acknowledgment. No permission is necessary for brief quotations and originally worded abstracts (less than 300-word total or 10 percent of length, whichever is least, for any one article). Written permission is required for reprinting or copying tables, figures, summaries, entire articles, or substantial portions thereof; such permission normally carries a charge of \$5 per page and is contingent upon agreement and possible stipulation of the original author or authors. Estate permission can be required. Authors requesting use of their own material are not charged. Fees may be waived for limited-copy instructional usage and for government periodicals. Special rates can be applied when justified.

The Journal of Psychology

Founded in 1935 by Carl Murchison

The Journal of Psychology was founded at the request of many psychologists throughout the world for the purpose of establishing a medium in which publication shall be immediate and in which other publication experiments may be carried out.

(1). The subscription price is \$39.00 per annum, \$18.00 per volume, \$9.00 per issue (three volumes per year).

(2). Manuscripts may be sent to any member of the Editorial Board or may be sent directly to The Journal Press. The lag in publication should not be more than a few weeks.

(3). The author will receive 200 reprints of his paper, and subscribers will receive the accumulated publications bound into half-volume units. The second half of each volume will contain the title page and table of contents for that volume. Each half-volume unit will be mailed to the subscribers at its stated date.

(4). Each author will be charged the manufacturing costs of any zincs, halftone cuts, tables, or equations. Excessive use of special fonts (references, footnotes, quotations, appendices) will also be charged.

(5). The publication charges are as follows:

1 to 4 pages	.....	\$60.00
5 to 8 "	.....	120.00
9 to 12 "	.....	180.00
13 to 16 "	.....	240.00
17 to 20 "	.....	300.00
21 to 24 "	.....	360.00
25 to 28 "	.....	420.00
29 to 32 "	.....	480.00

These charges are subject to adjustment as justified.

(6). The accumulated units will be mailed to subscribers bimonthly: January, March, May, July, September, and November. The units may vary in size to accommodate publication needs.

All back issues are available. See announcement on inside front cover.

THE JOURNAL PRESS

2 Commercial Street

Provincetown, Massachusetts 02657

U. S. A.



Journal of Genetic Psychology

Founded by G. Stanley Hall in 1891; reorganized by Carl Murchison in 1925

Quarterly, beginning with March. Devoted to developmental and clinical psychology, with briefly reported Replications and Refinements and occasional book reviews. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of General Psychology

Founded in 1927 by E. B. Titchener and Carl Murchison

Quarterly, beginning with January. Devoted to experimental, physiological, and comparative psychology, with briefly reported Replications, Refinements, and Comments. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Journal of Social Psychology

Founded in 1929 by John Dewey and Carl Murchison

Bimonthly, beginning with February. Devoted to studies of persons in group settings and of culture and personality; special attention to cross-cultural articles and notes, to field research, and to briefly reported Replications and Refinements. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Three volumes annually. Per annum, \$39.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

Each author will receive 100 unbound reprints gratis. Additional reprints may be purchased at a nominal cost when the author returns page-proof.

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Club Rate for Five International Psychological Journals

	PER ANNUM
THE JOURNAL OF GENETIC PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
GENETIC PSYCHOLOGY MONOGRAPHS (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF GENERAL PSYCHOLOGY (Quarterly, two volumes per year)	\$26.00
THE JOURNAL OF SOCIAL PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
THE JOURNAL OF PSYCHOLOGY (Bimonthly, three volumes per year)	\$39.00
	<hr/>
	TOTAL \$156.00
TEACHERS AND STUDENTS EDITION, <i>Restricted Sale</i>	\$50.00

The *Teachers and Students Edition* is open to any individual psychologist, teacher, student, or physician but requires an agreement that the edition will not be offered for sale till after five years from publication and an agreement that the edition will not be substituted for an institutional subscription. Write for our Teachers and Students contract card.

THE JOURNAL PRESS

2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

Genetic Psychology Monographs

Founded in 1925 by Carl Murchison

Quarterly, beginning with February. Devoted to developmental and clinical psychology. Each number one or more complete researches. Manuscripts may be sent to any member of the Editorial Board or directly to The Journal Press. Subscriptions should be sent directly to The Journal Press, and business communications addressed to the Managing Editor. Two volumes annually. Per annum, \$26.00; per volume, \$18.00; single numbers, \$9.00. All back issues available. See announcement on inside front cover.

NOTICE. Effective immediately we offer prior publication for certain selected monographs. Charges will be based on the announced rates for *The Journal of Psychology*. Regular monographs will carry no page charge for the first 50 pages, but for all pages above 50 there will be a charge of \$10.00 per page. Manufacturing costs of any zincs, halftone cuts, tables, or equations will be charged to authors, as will excessive use of special fonts. Two hundred reprints of each monograph will be supplied free of charge.

The listing of monographs for 1926 through 1963 will be printed in the first half of each volume of all five journals. Monographs published after 1963 will be listed in the second half of each volume.

Genetic Psychology Monographs (continued)

- VOLUME 69—January-June, 1964
- Occupational and industrial therapy in the treatment of psychiatric patients: A controlled study of efficacy in intensive-treatment institution—M. HUNDZIAK AND B. PASAMANICK
An analysis of Carl R. Rogers' theory of personality—M. S. KRAUSE
Personality aspects of teaching: A predictive study—H. ZIMILES, B. BIBER, W. RABINOWITZ, AND L. HAY
 - Situational and personal antecedents of incipient alienation: An exploratory study—W. H. JARRETT AND A. O. HALL
Age changes in children's Mosaic responses from five to ten years—L. B. AMES AND F. L. ILG
A study of the interview process: The caseworker-client relationship—H. J. MEYER, E. F. BORGATTA, AND D. FANSEN
A study of introversion-extroversion as a personality dimension—R. M. ALLEN, H. M. RICHER, AND R. J. PLOTNIK
Psychological testing with Northwest Coast Alaskan Eskimos—C. E. PRESTON
A study in family pathology—M. B. HANS

- VOLUME 70—July-December, 1964
- Structure and function—H. GUTMAN
The Lowenfeld Mosaic Test: Norms for five-to-ten-year-old American public-school children and comparative study of three groups—L. B. AMES, F. L. ILG, AND J. AUGUST
Social and personality correlates of children's estimates of height—J. P. SHAFFER
The development of ethnic attitudes in New Zealand school children—G. M. VAUGHAN
 - The antecedents of two varieties of vocational interests—L. E. TYLER
Personality in old age—P. E. SLATER AND H. A. SCARR
Variables affecting experimenter bias in a group situation—R. ROSENTHAL, C. J. FRIEDMAN, G. A. JOHNSON, K. FORD, T. SCHILL, R. C. WHITE, AND L. L. VIKAN
Ordinal position and sex role identification—B. G. ROSENBERG AND B. SUTTON-SMITH
Personality correlates of accuracy of self-appraisal in four-year-old children—PAUL S. WEINER

- VOLUME 71—January-June, 1965
- A theoretical, developmental, and clinical investigation of embarrassment—J. M. SATTLER
School readiness as evaluated by Gesell developmental, visual, and projective tests—F. L. ILG, L. B. AMES, AND R. APPELL
Rorschach scales of regression in psychosis—S. NEIGER, A. G. SLEMON, AND D. A. QUIRK
The effects of extra tactile stimulation on a group of institutionalized infants—L. CASLER
Human-eyelid conditioning: The recent experimental literature—L. E. ROSS AND T. F. HARTMAN
 - Social status and schoolroom aggression in third-grade children—R. TOIGO
Overt and covert homosexual problems among male college students—L. J. BRAATEN AND C. D. DARLING
Role conceptions of the psychiatric aid—M. P. LAWTON AND A. E. GOLDMAN
Changes in study of values scores during the four years of college—C. W. HUNTLEY

- VOLUME 72—July-December, 1965
- A study of process and method in three-year-old twins and triplets learning to read—W. FOWLER
Individualized teaching with therapeutic aims: A methodological study—M. KOHN AND M. RUENICK
Ability and social adjustment at midlife of persons earlier judged mentally deficient—E. L. MILLER
 - Development of incentive values in childhood—S. L. WITRYLO, D. J. TYRRELL, AND L. M. LOWDEN
Longitudinal changes in intolerance and authoritarianism for subjects differing in amount of college education over four years—W. T. PLANT
An NDEA counseling and guidance institute: Prediction, performance, and follow-up—R. H. DANA
The influence of language on classification: A theoretical model applied to normal, retarded, and deaf children—H. C. FURTH AND N. A. MILGRAM
Time estimates as affected by incentive class and motivational level—M. FELIX
Clinical psychology: An historical survey—V. S. SEXTON

- VOLUME 73—January-June, 1966
- Vulnerability in infants and young children: A pilot study—G. HEIDER
Racial preference and ego-identity among white and Bantu children in the Republic of South Africa—A. J. GROENE AND D. A. MCPHERSON
Mother-child interaction in cerebral palsy: Environmental and psychosocial obstacles to cognitive development—E. SHERE AND R. KASTENBAUM
Children's stories—L. B. AMES

- VOLUME 74—July-December, 1966
- Changes in personality for groups completing different amounts of college over two years—W. T. PLANT AND C. W. TELFORD
Brain dynamism in perception of reversible figures—G. K. YACORZYNSKI
Changes in Rorschach response throughout the human life span—L. B. AMES
Mnemonic virtuosity: A study of chess players—A. BINET (Translated by M. L. SIMMEL AND S. B. BARRON)
The development of behavior patterns in children—B. B. TYLER, F. B. TYLER AND J. E. RAFFERTY
Correlates of classroom functioning—L. M. SMITH AND B. B. HUDGINS
Children's behavior syndromes and parental responses—R. L. JENKINS, E. NUREDDIN, AND I. SHAPIRO

- VOLUME 75—January-June, 1967
- Studies of an elementary game of strategy—B. SUTTON-SMITH AND J. M. ROBERTS
Child care practices anteceding three patterns of preschool behavior—D. BAUMRIND
The impact of cognitive maturity on the development of sex-role attitudes in the years 4 to 8—L. KOHLBERG AND E. ZIGLER
Differential factor structures in mathematical ability—P. S. VERY
Perception of the vertical as a function of affective stimuli and extraneous stimulation in schizophrenic and normal subjects—J. O. WELLS AND W. E. CALDWELL
Mid-life attainment of the mentally retarded: A longitudinal study—W. R. BALLER, D. C. CHARLES, AND E. L. MILLER

- VOLUME 76—July-December, 1967
- Scalogram analysis of some developmental sequences of infant behavior as measured by the Bayley Infant Scale—M. KOHEN-RAZ
The leader and the lost: A case study of indigenous leadership in a poverty program community action committee—L. A. ZURCHER
A developmental study of the perception of people—R. N. WOLMAN
Human fears: A factor analytic study of three age levels—G. W. RUSSELL
Correlates of voluntary social participation—J. E. TEELE
Personality characteristics and developmental history of creative college women—R. HELSON
A systematic study of therapeutic interventions in nursing homes—B. A. STOTSKY

- VOLUME 77—January-June, 1968
- The fulfillment of promise: 40-year follow-up of the Terman Gifted Group—M. H. ODEN
A scale for parents' ratings: Some ipsative and normative correlations—R. N. WALKER
A methodological investigation of Piaget's concept of conservation of substance—A. D. WALKER
Sex differences in mental and behavioral traits—J. E. TEELE

Genetic Psychology Monographs (continued)

VOLUME 78—July-December, 1968

VOLUME 78—July-December, 1968
 1. A theoretical and developmental investigation of delayed speech feedback—J. E. WATERS
 Growth changes in factorial structure by age and sex—N. W. DYE AND P. S. VERY
 A multispect investigation of masculine development in kindergarten age boys—H. B. BILLER
 The optimum limits of testing on the Wechsler Intelligence Scales—M. Y. QUERESHI
 A developmental study of the ego-ideal—L. VAN DEN DAEL
 The relationship between physical condition immediately after birth and
 N. EDWARDS

VOLUME 79—January-June, 1969

VOLUME 79—January-June, 1969

Adolescents: From the views of the members of an informal adolescent group—T. P. JOSEPH
Acculturation and childhood accidents among Chinese and Japanese Americans—M. KUROKAWA
Dimensions of achievement-related behavior among lower-class Negro parents—D. SOLOMON, R. J. PARELIUS,
T. V. BUSSE
Dimensions in the judgment of illness—J. S. KERRICK
Reversal shifts and problem-solving abilities at ages 4-7—S. B. KASTNER
The judgment of body landmark heights—H. NASH
Recognition of body surface regions—H. NASH

VOLUME 80—July-December, 1969

VOLUME 80—July-December, 1969

Animal aggression: Review of research—W. M. VERNON
The effects of positive and negative reinforcement and test anxiety on the reading performance of male elementary school children—S. COTLER
Personality and psychosomatic illness: A selective review of research—P. R. ROBBINS
Task and motivational influences on the assessment of creative and intellectual ability in children—N. KOGAN AND F. T. MORGAN
A study of an interview method for identifying family authority patterns—R. W. CHAMBERLIN
Conditioned reinforcing and aversive aspects of the stimuli defining the components of a two-component chain—A. KAUFMAN AND A. BARON
The Henry Hittleson Center Family Interaction Scales—M. L. BEHRENS, D. I. MEYERS, W. GOLDFARB, N. GOLDBERG AND N. D. FIELDSTEEL

VOLUME 81—January-June, 1970

attitudes of college students and their changes: A 37-year study—V. JONES
 sex differences in mental health—J. E. GARAI
 selective review of dominance-subordination relations in animals—D. VAN KREVELD
 the effects of visual or auditory stimulation given in infancy upon subsequent preference for stimulation of both modalities—W. R. BERKOWITZ
 the influence of certain child-rearing factors upon the development of a structured and salient sense of time—D. ZEGLER

VOLUME 82—July-December, 1970

child care attitudes and emotional disturbance among mothers of young children—B. J. COHLER, J. L. WEISS, AND
 F. U. GRUNBAUM
 study of intragroup and intergroup relations among experimentally produced small groups—L. N. DIAB
 development of role knowledge—D. R. HUISE AND E. P. M. ROBERTS
 Adolescence: Age related stress periods during adult years—J. E. HORROCKS AND M. C. MUSSMAN
 first six years of life: A report of current research and educational practice—E. LACROSSE, P. C. LEE (ED.),
 LITMAN, D. M. OGILVIE, S. S. STODOLSKY, AND B. L. WHITE

VOLUME 83—January-June, 1971

VOLUME 83—January-June, 1971

Assessment of parents' perceptions of their children's development—W. WOLFENBERGER AND R. A. KURTZ

Concomitant development of cognitive and moral modes of thought: A test of selected deductions from Piaget's theory—L. C. LEE

Children's influences upon parental behavior: An attempt to define the relationship with the use of laboratory tasks—D. OSOFSKY

Parent behavior and child academic achievement, achievement striving, and related personality characteristics—SOLOMON, K. A. HOULIHAN, T. V. BUSSE, AND R. J. PARELIUS

Personality factors and school success of average and special groups of ninth-grade boys—M. MEEKER AND C. E. MEYER

Personality correlates of vocational planning—R. BARNETT

VOLUME 84—July-December, 1971

VOLUME 84—July-December, 1971

Optical distortion as a function of stimulus objects, sex, naiveté, and trials using a portable model of the Ames Room—T. A. GERACE AND W. E. CALDWELL

Toxic behavior and reinforcement of fish *Brachydanio rerio*—W. F. FLANIGAN, JR., AND W. E. CALDWELL

Actualization, types of personality, and neuroses and psychoses—R. DREISTADT

Men's awareness of their bodily appearance: A developmental study of factors associated with the body percept—GELLERT, J. S. GIRCUS, AND J. COHEN

Magnetic phenomena: Some implications for the behavioral and neurophysiological sciences—F. RUSSO AND W. E. CALDWELL

Metric task leadership and the perception of deviance and subsequent conformity as functions of personality—L. LIBBY, JR.

Prisoners who plead insanity: A descriptive factor analytic study of personality, social, and history variables—M. W. L. L. L. L.

VOLUME 85—January-June, 1972

VOLUME 85—January-June, 1972

en's understanding of negation as a logical operation—S. S. FELDMAN
ive auditory perception of parental voices by the disturbed child—S. SANDERS
y type, sociometric ratings, and group behavior—C. N. ZIMET and C. SCHNEIDER
as of perceived reaction to frustration among adolescents—J. O. PALMER
need for influence: Development and validation of a measure, and comparison with the need for power—
J. ULEMAN
yd Morgan, E. C. Tolman, and comparative method—E. NEWBURY
ning motor skills in hemiplegia: Error analysis—L. DILLER, J. BUXBAUM, and S. CHIOTELIS
of participation in rule formation on the moral judgment of children—R. L. MERCHANT and F. REBELSKY
nancy and attention in the five-month infant—C. M. SUPER, J. KACAN, F. J. MORRISON, M. M. HAITH, and
EIFFENBACH

Genetic Psychology Monographs (continued)

VOLUME 86—July-December, 1972

- The role of enduring orientations to the environment in personality development—W. C. BRONSON
Is there an error of the standard? A critique of Piaget's perceptual theory—D. A. BEGELMAN AND C. J. STEINFELD
A cross-cultural study of the relationship between resistance to temptation and maternal communication—E. R. GREENGLASS
The intellectual and achievement effects of preschool cognitive stimulation of poverty Mexican-American children—W. T. PLANT AND M. L. SOUTHERN
- Factors affecting agnostic behavior in several subhuman species—R. F. GOTTIER
Differential behavioral characteristics of nonpromoted children—J. A. CHASE
An analysis of cognitive-developmental sequences—J. H. FLAVELL

VOLUME 87—January-June, 1973

- A survey and interpretation of article characteristics: *The Journal of Genetic Psychology* 1945-1969—J. E. HORROCK AND J. D. HOGAN
The development of listener adapted communications in grade-school children from different social-class backgrounds—K. T. ALVY
Locus of control among schizophrenics and other hospitalized psychiatric patients—T. F. CASH AND J. J. STAG
Interactive styles and social adaptation—C. N. EDWARDS
- The motivation of exploration strategies in young children—J. D. COLE
Children's representation of the human figure: The effects of models, media, and instructions—C. GOLOMB
A perceptual program for classroom teachers: Some results—R. N. WALKER AND J. STREFF
Behavioral approaches to study and treatment of psychogenic tics—M. HERSEN AND R. M. EISLER
Patterns of intellectual development during childhood and adolescence—M. Y. QUERESHI

VOLUME 88—July-December, 1973

- Adolescent marginality—A further study—J. H. BAMBER
Psychological problems of abortion for the unwed teenage girl—C. D. MARTIN
Perceptual preferences in relation to aspects of personality—L. M. GOODMAN
An exploratory study of personality manifestations in paintings—R. B. BURT
- A developmental study of cognitive dissonance as a function of level of intellectual performance on Piagetian tasks—A. BIAGGIO, G. A. WEGNER, AND S. C. SIMPSON
The validity of parent-child socialization measures: A comparison of the use of assumed and real parent-child similarity with criterion variables—G. COUNT-VAN MANEN
Racial preference and identification of black, American Chinese, and white children—D. J. FOX AND V. B. JORDAN
Obsessional neurosis: Etiology and biopsychological presuppositions—A comparative study involving Freudian and Piagetian theory—R. PIVETTA
Dimensions of competence in young children—F. ALI
Differentiating children's symptom checklist items on the basis of judged severity of psychopathology—E. E. LESSING
H. BEISER, M. KRAUSE, P. DOLINKO, AND S. W. ZAGORIN

VOLUME 89—January-June, 1974

- Transgression as a function of timing of punishment and age—T. A. CHANDLER
Perception of vocal expression of emotion by hospital staff and patients—H. NASH
Development of geometric imagery in five- to eight-year-olds—C. J. BRAINERD AND K. VANDEN HEUVEL
Modern logic and schizophrenic thinking—D. Y. F. HO
- Brain dynamism in visual illusions of motion—G. K. YACORZYNSKI
The immediate recognition of tachistoscopically presented visual patterns by backward readers—I. M. CLIFTON-EVERED
Acquisition of the social desirability response—J. A. WALSH, C. TOMLINSON-KEASEY, AND D. M. KIEGER
The adolescent antecedents of an ego model of coping and defense and comparisons with Q-sorted ideal personalities—N. HAAS
Alfred Binet's remarkable questions: A cross-national and cross-temporal analysis of the cultural biases built into the Stanford-Binet Intelligence Scale and other Binet tests—M. W. SMITH

VOLUME 90—July-December, 1974

- A study of the relationship between physical transitivity and social transitivity—K. FEIGENBAUM
Development of self-identification in relation to attitudes towards the self in the Chippewa Indians—B. G. ROSENTHAL
Criterion-referenced tests of school readiness: A paradigm with illustrations—J. McV. HUNT AND G. E. KIRK

THE JOURNAL PRESS
2 Commercial Street
Provincetown, Massachusetts 02657
U. S. A.

PUBLICATION IN THE JOURNAL OF PSYCHOLOGY

The Journal of Psychology provides a special service to authors and readers. Articles accepted for publication appear in print with the least possible delay. Although editorial standards are the same as those for the other journals, all correspondence and handling are expedited, and the referees may, at their discretion, permit some latitude in length of treatment with respect to tabular material, discussion, and review of the literature.

To save time, authors are requested to exercise unusual care in preparing their papers. Special attention should be paid to the General Instructions on the back cover of each issue and to the announcement on the first preliminary page.

\$39.00 per annum
\$18.00 per volume
Single Numbers \$9.00

BIMONTHLY
Three volumes per year
Immediate publication
(Founded in 1935 by Carl Murchison)

November, 1974
Volume 88, Second Half

The Journal of PSYCHOLOGY

The General Field of Psychology

If this space should be unstamped, this is the regular library edition. But if this space is stamped with a designating title, this is a special edition, sold under the

restrictions of a bilateral contract, and may not be resold for a period of five years from the date of publication.

NOVEMBER, 1974

(Manuscripts are printed in the order of final acceptance)

Characteristics of emergent leaders of continuing problem-solving groups . . .	167
BY BEATRICE SCHULTZ	
Implicit phonological rules in children: An examination of Messer's and Menyuk's work . . .	175
BY SHIRLEY M. FINCHAM AND JOHN A. MILLS	
The relationship between creativity and ego development . . .	191
BY EDWARD A. WORKMAN AND JUDITH M. STILLION	
The effect of pretesting upon the risky shift . . .	197
BY JAMES A. SCHELLENBERG	
Status comparability and attitudes toward a foreign host nation: A cross-cultural study . . .	201
BY CHARLES A. SALTER	

(OVER)

Copyright © 1974 by The Journal Press
Provincetown, Massachusetts, U. S. A.

All rights reserved

Second-class postage paid at Provincetown, Mass
and additional mailing offices

Send all mail to Managing Editor, 2 Commercial Street, Provincetown, Massachusetts 0265

The impact of group therapy on penitentiary vocational and academic education programs	215
BY ALBERT N. B. NEDD AND EMILE S. SHIHADDEH	
Communicative patterns of self-disclosure and touching behavior	223
BY J. LOMRANZ AND A. SHAPIRA	
Sex differences in preferences for sex of children: A replication after 20 years	229
BY RALPH D. NORMAN	
Development of a current scale to measure conservatism-liberalism	241
BY HANNA LEVENSON AND JIM MILLER	
Responsiveness to humor: Its dependency upon a companion's humorous smiling and laughter	245
BY ANTONY J. CHAPMAN AND WENDY A. CHAPMAN	
Group stress, criticism by a subordinate, and the use of power	253
BY EUGENE M. FODOR	
Sex-role stereotypes: Perceived childhood socialization experiences and the attitudes and behavior of adult women	261
BY CELIA M. HALAS	
On determining pornographic material	277
BY JUDITH HOUSTON, SAMUEL HOUSTON, AND E. LAMONTE OHLSON	
The relative importance of the subtests of the Metropolitan Readiness Test in the prediction of first grade reading and arithmetic achievement criteria	289
BY ANN W. ENGIN	
A re-evaluation of Raven's Standard Progressive Matrices	299
BY KEN R. VINCENT AND JOHN A. COX	
Sex prejudice in jury simulation	305
BY COOKIE STEPHAN	
Attitude similarity and liking for a supervisor	313
BY KATHERINE C. GOOD AND LAWRENCE R. GOOD	
Age and sex discriminations in five- and six-month-old infants	317
BY ROBERT E. LASKY, ROBERT E. KLEIN, AND SONIA MARTÍNEZ	
Effects of affective expression on divergent thinking production	325
BY MARIE DELLAS	
Development of mirror image responses in infancy	333
BY JANE R. DICKIE AND WILLIAM H. STRADER	

CHARACTERISTICS OF EMERGENT LEADERS OF CONTINUING PROBLEM-SOLVING GROUPS*

School of Public Communication, Boston University

BEATRICE SCHULTZ

SUMMARY

This study evaluated the characteristics of emergent leaders of problem-solving groups with use of semantic differential scales. Subjects were 64 American university undergraduates. Each subject rated all subjects in his group, self included, at each of five sessions. Persons selected as leaders were found by a *Q* factor analytic technique to cluster on the basis of the following common characteristics: higher than nonleaders in giving directions, formulating goals, and being self-assured; lower than nonleaders in being more quarrelsome and less sensible.

The qualities characteristic of emergent leaders are assigned to them early, remain relatively consistent, and seem independent of personality characteristics. Whether they can be taught to participants who will subsequently be perceived as leaders is currently under investigation.

A. INTRODUCTION

The literature is replete with studies of leadership emergence in small, initially leaderless groups. A majority of these studies have looked at the phenomenon of leadership from the perspective of the leader's style and personality traits, the particular needs of the group, and those leadership functions that contribute to achieving group goals.

Recently, studies by Gouran and Fisher (3, 4), among others, have pointed to weaknesses in each of these approaches, especially for investigators of the specific communication acts associated with leadership. Fisher, moreover, questions the value of studies that do not deal with real groups solving problems involving a process of on-going communication. According to Fisher, the process model requires viewing leadership as a function performed by the leader rather than the currently popular construct of situational determinism.

* Received in the Editorial Office on July 24, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

Another difficulty in assessing qualities emergent leaders possess has been the emphasis on evaluation of leadership acts by external observers. As Sanford has suggested, "There is some justification for regarding the followers as the most crucial factor in any leadership event. . . . Not only is it the follower who accepts or rejects leadership, but it is the follower who perceives both the leader and the situation . . ." (7, p. 4).

Hollander (5) further voices the desirability of examining time-linked variations. With the assumption that each person is of equal importance when a group begins deliberations, it is appropriate to ask, after Hollander, which factors are selected by participants that correspond with leadership emergence.

The present study is concerned with ascertaining those variables related to leadership emergence in the perception of each participant. The investigator is interested in determining whether such variables can be used to predict emergent leadership and whether these potent variables can be used to train potential leaders. This study is limited to the first task: evaluating the variables pertaining to leadership emergence in groups that meet repeatedly while performing tasks involving communication interaction. The study focuses on three hypotheses:

1. Since it is accepted that any leader has some particular qualities, is there a specific set of qualities necessary to leadership emergence? Is there one major quality that flags a leader?
2. Regardless of the composition of the group and the nature of the problem to be solved, is there consistency in the characteristics attributed to leaders?
3. Do leadership qualities alter their potency over repeated meetings? Are the same characteristics that depict a leader in the first session used in subsequent sessions?

B. METHOD

Nineteen variables were abstracted from results of studies on leadership in small groups. Each of the 19 had appeared in or had proven to be potent in some study of leaders chosen during laboratory simulation research. A response form using a semantic seven-point scale with random ordering of the variables was used by all raters in every session. Variables delineated either personal qualities or contribution to group qualities, as follows: 1. cooperative/uncooperative; 2. seeks information/does not seek information; 3. self-assured/hesitant; 4. formulates goals/does not formulate goals; 5. cheerful/gloomy; 6. objective/biased; 7. harmonious/quarrelsome; 8. gives

directions/does not give directions; 9. enthusiastic/unenthusiastic; 10. summarizes/does not summarize; 11. supportive/hostile; 12. interesting/boring; 13. informative/uninformative; 14. goal-oriented/directionless; 15. assertive/defensive; 16. interesting/uninteresting; 17. precise/clear; 18. imaginative/dull; 19. sensible/not sensible.

Undergraduates in three classes ($n = 64$) in consecutive semesters of a course in Discussion and Group Methods at Indiana University participated in five problem-solving sessions of approximately 45 minutes each. Group meetings were held in five contiguous sessions of Monday, Wednesday, and Friday classes. Nine groups, varying in size from six to eight, were formed across the three classes by self-selection according to subject area or by random assignment. Each group had a problem of social or political concern and was expected to formulate a consensus solution which later would be presented to the class. One class, groups 1-3, was given no practical constraints on their decisions; the second and third classes, groups 4-6 and 7-9, had to arrive at some decision open to practical implementation. Class three differed from Class two in that groups 7-9 contained one person each, covertly and randomly chosen, who was to act as if he or she were the leader, in whatever way the role was perceived, the behavior being initiated with session 2 and continuing throughout.

Each participant in each group rated all in that group, self included, on the 19 variables, for five minutes before the end of each session. Each discussant also indicated on the rating sheet for each session whether he felt that a leader or leaders had emerged, and if so, who. Additionally, each was charged to maintain an ongoing diary to be collected at the end of the experiment, as well as a final evaluation sheet concerning the individual's satisfaction with the discussion process and the group's decision.

Data were subjected to a multivariate Q factor analysis using the Quanal program comprising principal component factor analysis and varimax rotation. A Q factor analysis clusters subjects into types for subsequent communal labeling rather than clustering variables. The criterion cutoff for rotation was an eigenvalue of 1.0. The Quanal program contains a phase wherein it rank orders the loadings of variables, positively and negatively on each factor, facilitating subjects, variables, and factor evaluations.

Forty-five factor analyses were undertaken, one per group per session. The basic data were the evaluations of each group member on every other group member for all 19 variables at a single session (an eight person group generated a 64×19 matrix). Analyses were constrained to four factors. When a factor had some significant negative variable assignment, the nega-

tive items were extracted, made positive, and formed into an additional factor type, generating up to eight factor types.

C. RESULTS

Foremost was the finding that leaders clustered into types differently than nonleaders. That is, when individual rating sheets naming leaders or diaries naming leaders were used to list those commonly chosen, these perceived leaders were found to have been clustered by the program. Examination of the type in each of the 45 analyses which contained the leader cluster shows high ratings and low ratings for selected variables as displayed in Table 1.

The table is constructed by segregating persons chosen by any group member as a leader in each session, examining which of the eight types the chosen leader(s) cluster in, and for that single clustering group, charting the variables showing z scores of at least ± 1 . Table 1 presents those variables attributed to the leader(s) for the nine groups during the five discussion sessions of each group. The left half of the table includes variables for which leaders obtained higher ratings than nonleaders; the right half of the table shows variables for which leaders obtained lower ratings than nonleaders.

TABLE 1
Variables on which Group-Named Leaders Cluster for Each Session

Groups	Variables for which leaders are rated higher									Variables for which leaders are rated lower								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
Session 1			4		3									5				
		8	8	8		4			8	8			7	7	7			
			10			8							9	9		11		
Session 2				14	14							16					12	
			15	15		13			14	15		18					16	16
												19			19		18	19
Session 3		3	3	3	3	3								5		5		
		4	4	4	4	4			8		7	7		6		6		6
		8	8	8	8	8												
Session 4																		
Session 5																		

* No leader cluster found in this session

In sum, the cluster containing leaders shows high scores in variable 8 (gives directions), variable 4 (formulates goals), and variable 3 (self-assured). This designated leader group shows lower ratings in variable 7 (quarrelsome) and variable 19 (not sensible). The latter two variables were weaker than the positive variables. Other variables that appear to flag a leader, though of less potency, are variables 10 (summarizes) and 15 (assertive).

D. DISCUSSION

The results of the present study indicate that leadership emergence among the students in this kind of situation corresponded with a few variables, that followers early perceived the potential leaders and assigned similar positive and a limited number of negative variables to the perceived leaders. The positive variables both flagged leaders in early sessions and continued to be potent in later sessions, combining increasing potency and intergroup consistencies in labeling leaders as the sessions proceeded. Though not consistent in every session, it appears that some variables where leaders scored lower than average may also have signified a potential leader.

Beginning in session 1, seven of the nine groups chose variable 8 (gives directions) as corresponding with perceived leaders. Designated leaders scored lower on variable 5 (cheerful-gloomy) and 16 (interesting-uninteresting). In session 2, variable 8 was again the choice of a majority of the groups for leadership designation. The potent variables were essentially unchanged in session 3. The negative variables 5 (gloomy) and 7 (quarrelsome) seemed more important in this midpoint session. Goal orientation (variable 14) and assertiveness (variable 15) were rated as significant when groups were formulating solutions to be presented to the entire class. In session 5, variable 10 (summarizes) assumed a new importance, understandable since participants were discussing a final solution and a method of presentation. The negative variables 7 (quarrelsome) and 19 (not sensible) also appeared to be strong in this session.

Overall, the participants showed little ambiguity in their choices of assigned variables. They labeled variables 3, 4, 8, and 10 positive attributes in each session. Similarly, variables 5, 7, and 19 were assigned as negative attributes. Only variable 18 (imaginative) was treated ambiguously. In session 3, some leaders were perceived as more imaginative; others, less so. This variable peaked in session 4 when leaders in five of the nine groups were perceived as less imaginative. In session 5, this variable washed out.

The constraint of finding a feasible solution appears to have affected vari-

ables chosen in later sessions. For example, variable 10 (summarizes) was chosen by groups 4-9, who were charged with finding a feasible solution. Groups 1-3, not under this constraint, did not assign this variable to designated leaders. In later sessions (4 and 5) groups 1-3 no longer labeled variable 8 (gives directions) as important for leadership, suggesting that the ability to summarize and to give directions may be more necessary for leaders in groups charged with finding a practical solution.

The use of a covert person to act as a leader in each group apparently made no difference in leadership assessment. None of these randomly chosen leader-designates was named by any of the participants as a leader.

The variables found to be related to leadership in this study appear to be similar to some suggested by other investigators. Of more significance, however, are the few functions identified with leadership emergence. While other studies (1, 6) have focused on the wide dispersal, variety, and contingency of leadership functions, the present study suggests that a leader is differentiated on the basis of a few functions, regardless of the groups' needs or the leader's personality attributes.

Interesting also is the failure of most items descriptive of personality attributes to attain significance. Although Fiedler (2) has used these items and others to determine potential leadership effectiveness, these characteristics of effective leaders, with the exception of harmonious-quarrelsome, did not seem to emerge as potent variables for leadership designation. Moreover, Fiedler and others have assumed that leadership effectiveness is contingent upon the leader's style of interacting with group members and with the favorableness of the group task. The results of the present study show that this alternative model may be equally effective for predicting leadership emergence when the task requires leadership effectiveness. Although this study did not measure directly the leader's style, an evaluation of the individual diaries shows that whether or not members interacted well or were satisfied with their task and group decision, followers perceived leaders by evaluating their skills in communicating directions and goals—not by assessing their personalities.

It is worth noting that the mere task of rating and self-assessment may contribute to the emergence of leadership. Each rater may perceive that he or she does not differ so much in personality as in communication skills. If this were found to be the case, then it would further enhance the relationship between communication acts and leadership. If, as this study shows, leaders do differ from followers in only a few functions, then one needs to evaluate how these functions are demonstrated to followers: that is, what are the communication signals followers perceive.

REFERENCES

1. CATTELL, R. New concepts for measuring leadership in terms of group syntality. *Hum. Relat.*, 1951, 4, 161-184.
2. FIEDLER, F. E. Personality and situational determinates of leadership effectiveness. In D. Cartwright & A. Zander (Eds.), *Group Dynamics: Research and Theory*. New York: Harper & Row, 1968. Pp. 362-369.
3. FISHER, B. A. Communication research and the task-oriented group. *J. Communic.*, 1971, 21, 136-146.
4. GOURAN, D. S. Group communication: Perspectives and priorities for future research. *Quart. J. Speech*, 1973, 59, 22-29.
5. HOLLANDER, E. P. *Leaders, Groups, and Influence*. New York: Oxford Univ. Press, 1964. P. 188.
6. KRECH, D., & CRUTCHFIELD, R. *Theory and Problems of Social Psychology*. New York: McGraw-Hill, 1948. Pp. 417-422.
7. SANFORD, F. H. *Authoritarianism and Leadership*. Philadelphia: Inst. for Res. in Hum. Relat., 1950.

School of Public Communication

Boston University

640 Commonwealth Avenue

Boston, Massachusetts 02115

IMPLICIT PHONOLOGICAL RULES IN CHILDREN: AN EXAMINATION OF MESSER'S AND MENYUK'S WORK*¹

University of Saskatchewan, Canada

SHIRLEY M. FINCHAM² AND JOHN A. MILLS³

SUMMARY

In Experiment 1, a study by Messer was replicated with use of 18 children aged 40 to 67 months and nonsense words in which the phonemes of the consonant onsets of permissible and impermissible words were equated for frequency of occurrence. The children did not choose significantly more permissible words at any age, indicating that they did not use phonological rules as a basis for choice. In Experiment 2, similar materials were used with 14 children aged 56 to 74 months. By means of an operant conditioning procedure and a learning set paradigm, an experimental group (five children) was reinforced for choosing the permissible member of 10 permissible/impermissible pairs of nonsense words to a criterion of 80 percent correct responses. On transfer to a test task (16 problems given at a rate of 12 trials per problem) the group reached a mean performance level of 76 percent correct responses, which was significantly greater than that attained by either of two control groups (nine children). It was therefore concluded that some evidence for the existence of implicit phonological rules had been obtained, although the conclusion had to be qualified because (a) the mean level of performance of the experimental group during the test task was relatively low, and (b) because only children with high IQs performed at a level better than chance.

* Received in the Editorial Office on July 29, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The study is based on a thesis presented by Mrs. Fincham in partial fulfilment of the requirements for an MA degree at the University of Saskatchewan and was supported by Grants No. APA 0279 from the National Research Council of Canada and S71-0964 from the Canada Council. The authors are grateful to Dr. Roger Stretch for his advice regarding the use of operant techniques.

² Now at 11018 110th Avenue, Edmonton, Alberta, Canada T5H 1H9.

³ Requests for reprints should be sent to the second author at the address shown at the end of this article.

A. INTRODUCTION

A system of rules placing constraints on the combinations of consonants that can occur in its morphemes is a feature of the formal structure of any language. Thus, 14,424 different combinations of three consonants or fewer could potentially occur in an initial position in English morphemes, but in fact fewer than 100 combinations are permissible (3, 8). It can be said that such a system of rules forms part of the system of phonological rules characteristic of languages (10). There have been a number of studies designed to explore the extent to which such rules govern the behavior of speakers of English.

Brown (2) showed that, in adult speakers of English, invented monosyllables had structures predictable from a formula used by Whorf (18) to describe English consonant combinations. Brown and Hildum (4), also using adults, showed that reproduction of nonsense words impermissible in terms of Whorf's formula was less accurate than the reproduction of permissible nonsense words and of real words. Menyuk (9), working with a group of young children, contrasted their ability both to reproduce and recall a list of impermissible nonsense words with their ability to reproduce and recall a list of permissible nonsense words. She found that all linguistically possible sequences were perceived with equal accuracy, whether they were permissible in English or not. However, in the recall task, words containing permissible onsets were reproduced more successfully than were nonpermissible ones. Menyuk concluded that children can comprehend differences in speech sound components before they can reproduce them, and that the existence of initial consonant cluster rules in the child's phonological system increased the speed with which the permissible sequences could be coded and stored. Messer (11), using pairs consisting of one permissible and one impermissible nonsense syllable, found that children as young as 39 months, when asked to choose either a permissible or an impermissible name for an experimental object, showed a preference for permissible words. Messer also analyzed mispronunciations of syllables and found that significantly more impermissible than permissible words were mispronounced, suggesting that the action of implicit phonological rules creates a predisposition to hear sounds that are permissible. Curiously, Messer did not find a significant correlation between age and proportion of permissible words chosen. While this might suggest that the child's system of rules is fully developed by the age of 36 months, it could also be an effect of the design. All Messer's children were required to pronounce both permissible and impermissible words before choosing one. Thus, there could have been a confounding between

the effects of any implicit morphophonemic knowledge the child might have and his phonemic production ability. The same consideration applies to Menyuk's study, as her Ss had to pronounce words in both learning and recall.

Another limitation of Menyuk's and Messer's studies lies in their choice of materials. Of Messer's 25 pairs of stimuli, in only five pairs were the onset consonants of both permissible and impermissible words approximately equal in frequency of occurrence in English, according to Hayden's (7) table of phoneme frequencies. In 16 pairs of the 25, consonants of the onsets of permissible words occurred far more frequently than the consonants of the impermissible words. In four pairs, frequency of occurrence of consonants in the onsets favored the impermissible word. Menyuk used only five onsets for permissible nonsense words, and five for impermissible. Again, in four out of five cases, frequency of occurrence of phonemes favored the permissible onsets. Thus, both Messer's and Menyuk's results could have been due to childrens' greater familiarity with specific phonemes, rather than to their implicit knowledge of combinations acceptable in English.

B. EXPERIMENT 1

1. *Introduction*

Experiment 1 was an attempt to overcome some of the limitations of Messer's and Menyuk's studies with use of stimulus materials that contained phonemes balanced for frequency of occurrence in English. In this way, responses that favor words beginning with permissible onsets are likely to be a result of the child's familiarity with such onsets.

2. *Method*

a. Subjects. The Ss were 18 children, eight males and 10 females, from the nursery school and kindergarten, Institute of Child Guidance and Development, University of Saskatchewan, Saskatoon. The Ss ranged in age from 40 months to 67 months, with a mean age of 56 months; IQs assessed by the Stanford Binet Revised Test, Form L-M, ranged from 102 to 158, with a mean of 132. The Ss came from homes in which only English was spoken, and none had auditory difficulties.

b. Materials. Stimuli were 25 pairs of nonsense words. One member of each pair was a permissible word (PE) in English generated by the Whorfian formula, the other member an impermissible word (IE) which violated the formula. In 15 of the 25 pairs, only the initial consonant cluster of the impermissible word violated the rules (IE₂). Permissible words corresponded

in structure to impermissible ones, except that their onsets and codae consisted of lawful consonant combinations. Both members of a pair were equated with respect to frequency of occurrence of phonemes in onset and coda, and the middle vowels were assigned randomly, with the restriction that frequency of occurrence was balanced for both PE and IE.

c. Procedure. The Ss were told that they were going to play a word game in which they were to tell *E* which of two nonsense words either (a) sounded more like a word they had heard before, or (b) they liked better, or (c) would be a better name for a block of wood. As a warm-up task, they were given one pair of words verbally, then three pairs were presented on a Sony cassette tape recorder. The experimental pairs were then presented, one word at a time, on the tape recorder. The *S* was required to repeat each member and then to choose one of the words, which were repeated again by *E*. The stimulus list was presented in the same order for each *S*, but the questions (a), (b), or (c) were presented in a counterbalanced order, so that each *S* responded to each question and every stimulus pair was coupled with each question an equal number of times. The Ss' pronunciation of each word, and their choice of PE or IE, were recorded both on tape and manually, and the results checked for accuracy.

3. Results and Discussion

The data of one *S* were discarded, as she consistently chose the second member of each pair throughout all trials. A sign test between the total numbers of PE and IE words chosen by each of the remaining 17 Ss indicated that there was no significant difference between them ($n = 15$, $p = .15$); Ss chose IE words as often as they chose PE words, the respective mean proportions of words chosen being .47 and .53. There was no tendency for any age group to choose more PE words, nor did the questions asked have any effect. An analysis of variance of proportions of PE words chosen showed there was no significant difference between either age groups or questions. Thus there was no evidence that the Ss used rules when choosing between permissible and impermissible nonsense words.

A sign test on the numbers of mispronounced words showed that significantly more errors were made on IE words ($n = 15$, $p < .001$); moreover, approximately 75 percent of the IE mispronunciations resulted in a word the onset of which conformed to Whorf's formula. This could be interpreted as evidence that children produce words according to morphonemic rules. However, the effect may well have been due to the fact that the child might have had difficulty pronouncing consonant combinations which he either

had not heard in conversation, or heard very seldom. He might then have tended to rearrange each stimulus to resemble a more commonly heard word. While the stimuli were balanced with regard to frequency of occurrence of individual phonemes, there was no attempt to balance for frequency of occurrence of phoneme combinations. Thus, there is nothing to indicate that the results are not due to the child's experience with specific words, rather than to implicit knowledge of phonological rules that apply to the English language in general.

C. EXPERIMENT 2

1. *Introduction*

In order to avoid possible confounding resulting from overt production of words, it seemed advisable to use an operant response in Experiment 2. Operant responses of various sorts have been conditioned in young children with some success. Simmons (16) was able to condition a simple discrimination in infants whose median age was 12 months. The Ss significantly increased their responses to a positive stimulus during conditioning and significantly decreased rate of responding to the positive stimulus in extinction. Rheingold, Stanley, and Doyle (15) found that children between the ages of two and five years maintained a high rate of response when they were given the opportunity to touch a ball that activated a short sequence of motion pictures accompanied by music.

After some exploratory work, the decision to use the learning set paradigm (6, 12) was reached. One explanation for the development of discrimination learning set (DLS) is Harlow's error-factor theory (6). Harlow believes, in essence, that DLS develops because the S learns to suppress error tendencies that attract him towards various classes of discriminanda and to pay attention only to the association between a particular discriminandum and reward. It was felt that the learning set paradigm was especially suitable in the present case because, firstly, the use of reward would direct the Ss' attention to the class of stimuli (permissible nonsense words in English) in an unfamiliar experimental situation, and secondly, a deduction from error-factor theory is that Ss should have a high tendency to respond to permissible words. A high rate of responding was therefore expected in the appropriate group.

The design of Experiment 2 can be summarized as follows. To avoid any confounding arising from pronunciation, an attempt was made to develop DLS for the discrimination of permissible *versus* impermissible consonant onsets with use of a single operant response, the bar press. One group of

children was given intensive training with pairs of nonsense stimuli, one member of which had an onset permissible in English, the other an impermissible onset. A second group of children was given similar training on grammatical *versus* ungrammatical sentence pairs. A third group received no training. Then all three groups were presented with a test series on new onset pairs for a limited number of trials. The expectation was that practice on successive onset discriminations would lead to the development of DLS with resultant high interproblem transfer, while practice on problems unrelated to phonological rules should have little effect.

To simplify the operant conditioning as much as possible, Ss were required to press the bar when S+ was presented, and to refrain from pressing when S- was presented, using the "go-no-go" technique (13). In order to ensure that the child would respond to the properties of each stimulus instead of responding continuously, it seemed advisable to punish incorrect responses in some way. In his review of techniques that permit the single bar press to be used for the generation of psychophysical functions, Weiskrantz (17) pointed out that in a "go-no-go" situation, the organism tends to respond continuously in early trials. Since continuous responding produces intermittent reinforcement, which in turn tends to produce a high and stable rate of responding, Weiskrantz suggested that the probability of response to the negative stimulus should be reduced by punishment. The simplest method of punishment, and one not detrimental to the child, is to introduce a time-out period (TO) whenever an incorrect response is made. Several studies have demonstrated that TO can be an effective punishing stimulus if the organism has available an alternate response that is not punished. For example, Ferster and Appel (5) observed that the matching-to-sample accuracy of pigeons increased directly with the duration of TOs following incorrect responses on an intermittent reinforcement schedule, and Zimmerman and Baydan (19) found that 10 second TO durations were as effective as longer intervals.

2. Method

a. Subjects. The Ss were six girls and eight boys from the kindergarten, Institute of Child Guidance and Development, University of Saskatchewan, Saskatoon. The children ranged in age from 56 months to 74 months (the mean age was 66 months). None of the children had auditory defects or gross learning problems, and they were all from unilingual backgrounds. IQs ranged from 95 to 155 (mean = 126).

b. Apparatus. The apparatus consisted of an upright panel 47 by 42

cm, supported by a horizontal panel 18 by 46 cm. On the S's side of the panel was a bar press, a red light 1.9 cm in diameter, and a reward chute leading to a plexiglass tray. The horizontal panel contained a fixed wooden box for storing rewards. The light was connected to a Hunter Decade Interval Timer, and the bar to an electromagnet on the E's side of the panel, through two six volt batteries. The magnet controlled a metal plate upon which the reward was placed. All circuits were linked to switches in parallel, so that the apparatus could be preset either to release a reward immediately or to turn off the red light when the bar was pressed. The outside dimensions of the rectangular area containing light, bar, chute, and box were 23 by 14 cm. Rewards were marbles, Smarties, pennies, or animal crackers, following the recommendations of Bijou and Sturgis (1).

c. *Stimuli*. Twenty-six pairs of nonsense stimuli were constructed of the form one, two, or three consonant onset, plus vowel, plus consonant. One member of each pair began with an onset permissible in English by Whorf's formula (S+) and the other with an impermissible onset (S-). The phonemes in both S+ and S- onsets were balanced for frequency of occurrence in English. Vowels and final consonants were assigned randomly, with the restriction that each occurred the same number of times in both S+ and S-, thus balancing frequency of occurrence. None of the nonsense stimuli were actual words in English. Ten of these pairs were chosen randomly as training stimuli, and 16 as test stimuli.

For unrelated training, 10 pairs of sentences were constructed, one member of each pair being grammatical, and the other departing from grammaticality by one feature. In each case, the particular feature to be contrasted was represented by a nonsense word, as for example in the pair "Today the giraffe is anviking quickly, but yesterday he *anviked* very slowly" and "Today the giraffe is anviking quickly, but yesterday he *anviking* very slowly". The nonsense words used in the sentences were constructed in a random fashion with the restriction that the onsets were phonemes not used in the onsets of the test nonsense words. The grammatical contrasts of the sentence pairs were present progressive tense or past tense, present progressive or future tense, affirmative *versus* negative, and number and tense agreement in compound and complex sentences, all from Brown, Fraser, and Bellugi's Test of Grammatical Contrasts [see Nurss and Day (14)].

Pretraining stimuli were 10 pairs of tones produced by an audio oscillator, and differing widely in intensity. All stimuli were recorded on a Sony cassette tape recorder.

d. *Procedure*. The Ss were divided into two groups of five children each

and one group of four children, matched with regard to *IQ*. The groups were balanced as closely as possible in age.

All three groups were told they were going to hear sounds, some of which were right and some wrong. They were instructed to push the lever when they thought the sound was right, and to refrain from pressing the lever if they thought the sound was wrong. They were told they would receive a prize when they had pressed correctly, but that the light would go off and stay off for a while if they pressed when they should not have. The instructions were repeated for each group before beginning training, and again before testing, except that the phrase "pretend words" was substituted for "sounds" before nonsense training and testing, and "sentences" before sentence training.

All three groups received training on an auditory intensity discrimination, 20 trials per stimulus, until they reached a criterion of 18 correct out of 20 on a particular problem. If an *S* made five or more errors out of 20 trials on the eighth problem, the discrimination was explained to him, and he was then given 20 trials on a new problem. All stimuli were presented successively in random order.

The experimental group (Group 1) was then given 10 permissible *versus* impermissible nonsense discriminations, with a minimum of 10 trials on each problem. *Ss* were trained to a criterion of eight correct responses out of 10 on each problem, or to a maximum of 80 trials. The first control group (Group 2) was trained on the 10 sentence discriminations until they reached a criterion of eight out of 10 sentences correct, or to a maximum of 80 trials. The second control group (Group 3) received no training beyond the auditory warm-up. In testing, all three groups were given 16 permissible *versus* impermissible nonsense discriminations, with six trials on each pair of stimuli (for a total of 12 trials per problem).

During both auditory pretraining and training, for each correct bar press to an *S*+, the *S* was rewarded immediately, and for each incorrect press to an *S*-, the red light went off immediately and remained off for 10 seconds. When the *S* did not press after presentation of a stimulus, the experiment was continued after an interval of three seconds. The *Ss* were allowed to take home their rewards at the end of each session.

3. Results

Two one-way analyses of variance showed that there were no differences with respect to age or *IQ* between the three groups (both *F*s = .45). The results of the training procedure are summarized in Figure 1. A split-plot analysis of variance of the number of trials to reach criterion showed that

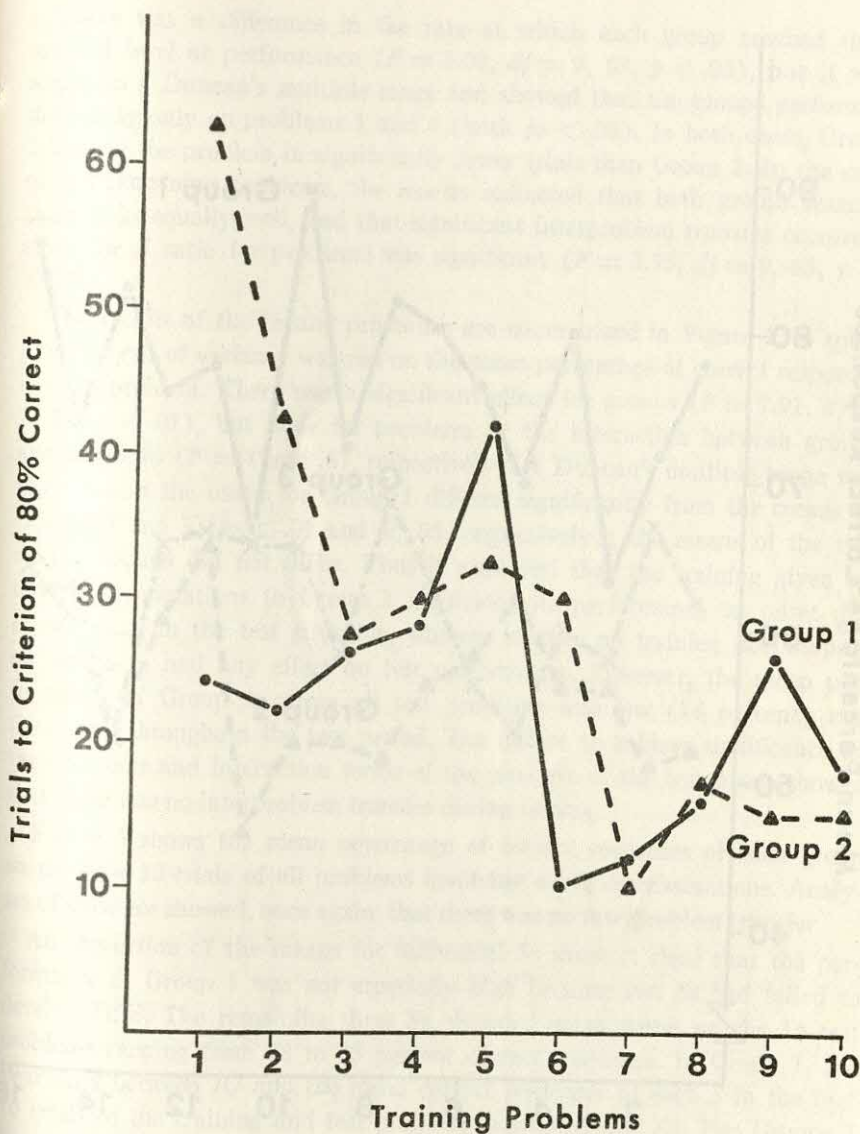


FIGURE 1
MEAN TRIALS TO CRITERION OF GROUPS 1 AND 2 ON
THE TRAINING PROBLEMS OF EXPERIMENT 2

there was no significant difference between Group 1 and Group 2 ($F = 2.61$, $df = 1, 7$).

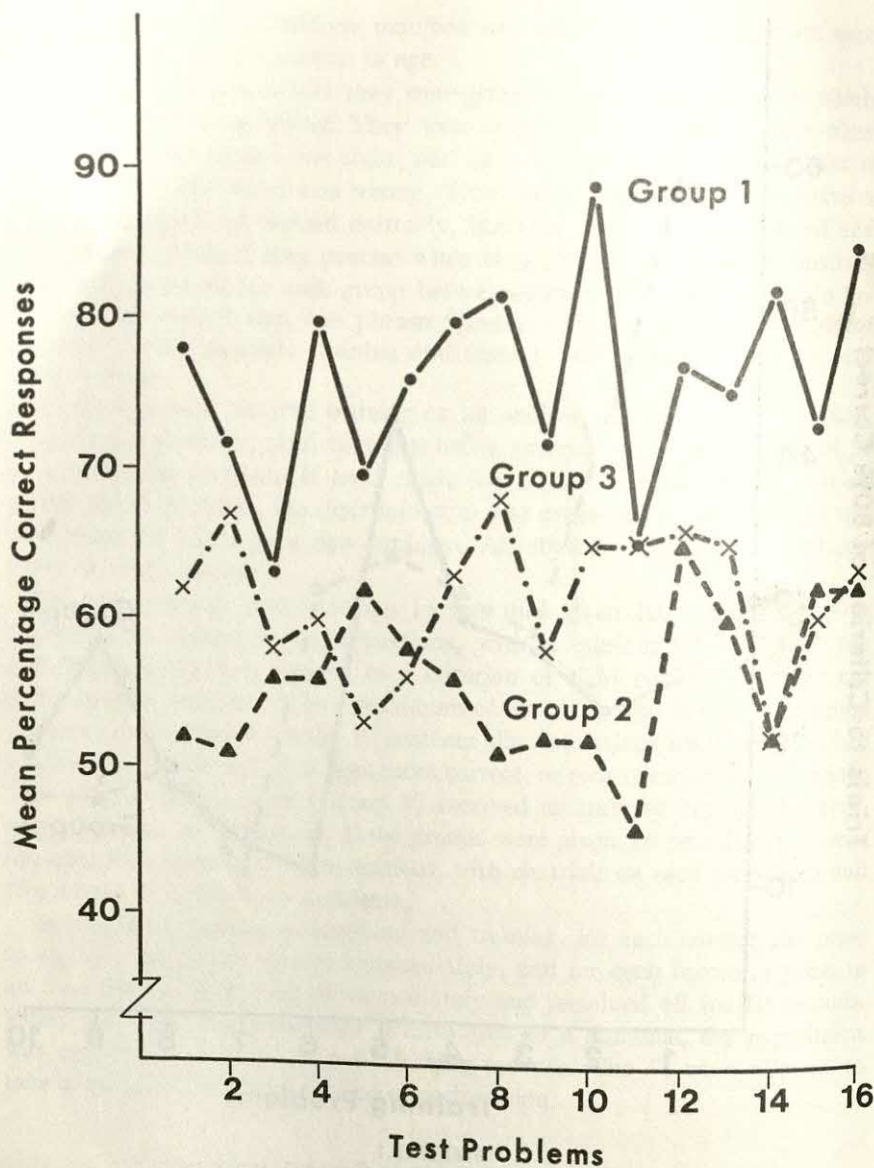


FIGURE 2
MEAN PERCENTAGE OF CORRECT RESPONSES OF GROUPS 1, 2, AND 3
ON THE TEST PROBLEMS OF EXPERIMENT 2

There was a difference in the rate at which each group reached their optimal level of performance ($F = 2.08$, $df = 9, 63$, $p < .05$), but it was slight, as a Duncan's multiple range test showed that the groups performed differently only on problems 1 and 6 (both $ps < .05$). In both cases, Group 1 learned the problem in significantly fewer trials than Group 2. In the case of the remaining problems, the results indicated that both groups learned their tasks equally well, and that significant interproblem transfer occurred, since the F ratio for problems was significant ($F = 3.55$, $df = 9, 63$, $p < .001$).

The results of the testing procedure are summarized in Figure 2. A split-plot analysis of variance was run on the mean percentage of correct responses in each problem. There was a significant effect for groups ($F = 7.91$, $df = 2, 11$, $p < .01$), but none for problems or the interaction between groups and problems ($F = 1$ and $.67$, respectively). A Duncan's multiple range test showed that the mean for Group 1 differed significantly from the means of Groups 2 and 3 ($ps < .01$ and $< .05$, respectively); the means of the two control groups did not differ. Thus it appeared that the training given on onset discriminations to Group 1 facilitated its performance on onset discriminations in the test situation, whereas neither no training nor training on sentences had any effect on test performance. However, the mean performance of Group 1 across all test problems was low (76 percent) and fluctuated throughout the test period. The failure to achieve significance on the problems and interaction terms of the analysis of the test phase showed that there was no interproblem transfer during testing.

Figure 3 shows the mean percentage of correct responses of each group on the first 10 trials of all problems involving onset discriminations. Analyses of variance showed, once again, that there was no interproblem transfer.

An inspection of the means for individual Ss made it clear that the performance of Group 1 was not especially high because two Ss had failed to develop DLS. The remaining three Ss obtained mean scores on the 16 test problems ranging from 78 to 85 percent correct responses. In Group 1, the Pearson r between IQ and the mean correct responses of each S in the first 10 trials of the training and test problems combined was $.98$. For Groups 2 and 3 the Pearson r between IQ and mean correct responses in the first 10 trials of testing for each S was $-.26$, so that the relationship between IQ and performance on the discrimination tasks emerged only following relevant discrimination training.

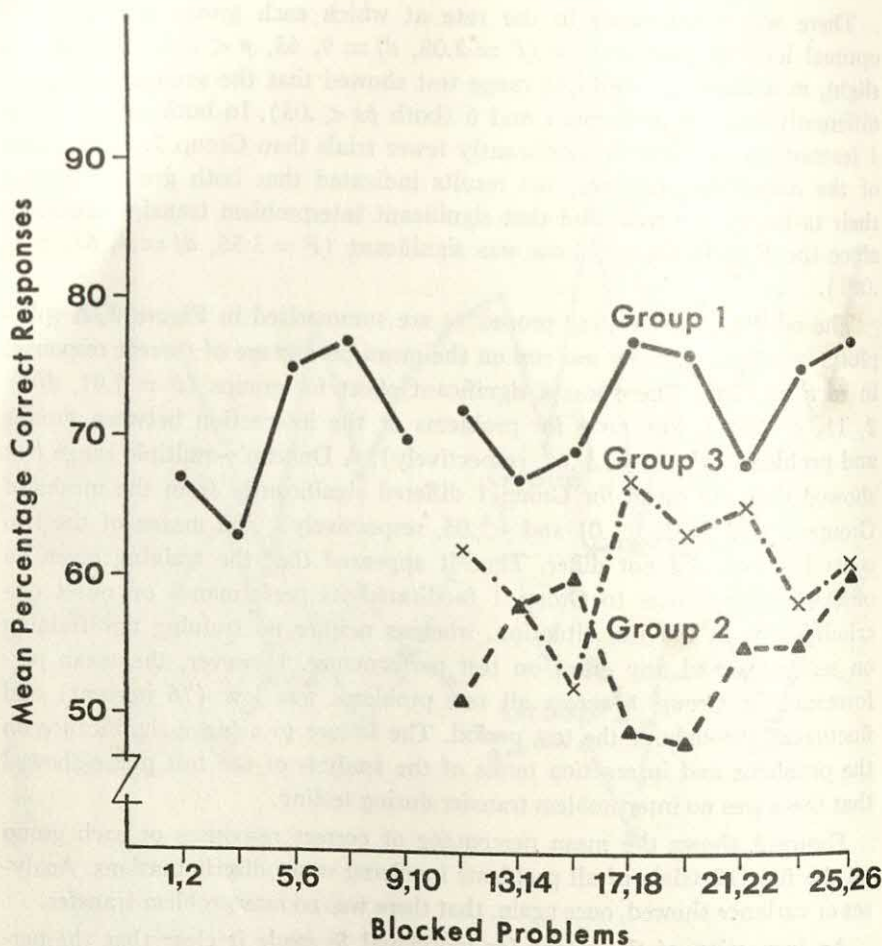


FIGURE 3
MEAN SCORES OF GROUPS 1, 2, AND 3 ON THE FIRST 10 TRIALS OF
THE TRAINING AND TEST PROBLEMS ON EXPERIMENT 2

D. DISCUSSION

The results of Experiments 1 and 2 will be discussed together. The results of Experiment 1 pose a problem in that the major dependent variables showed no evidence for the existence of morphophonemic rules, whereas the analysis of the pronunciation data showed that the errors in the Ss' repetitions of the impermissible words were such as to convert them into English

words, a result that would be anticipated on the hypothesis that there are morphophonemic rules. The inconsistency can be removed by considering the type of evidence that is required to demonstrate the reality of the rules. If the system of rules is to be truly effective, then it should allow the children to perceive the differences between consonant onsets that are likely to occur in English and those that are not. The argument could then be carried further by supposing that only in the former case will the child make an effort to include the word in his vocabulary by finding out its meaning, learning to pronounce it, and discovering something about its usage. The data from Experiment 1 provide no support for the existence of such a discriminatory process. All the words used were nonsense words, and the children found the two categories equally acceptable. It is plausible to argue that both in pronouncing the words and in choosing one member of a pair they were guided by specific factors, such as resemblances between a stimulus word and a word in their vocabulary, so that the system of rules had no psychological function.

The results of Experiment 2 were more satisfactory than those of Experiment 1. The fact that the mean score of Group 1 in testing was higher than that of both the control groups, whose mean scores were equal, shows that there was no negative transfer from training to testing for Groups 1 and 2. The positive transfer of Group 1 can be attributed to cues mastered during the training stage. Nevertheless, it must be noted that the mean level of performance in the test stage was relatively low, there was no interproblem transfer during testing, and the only children in Group 1 who showed significant transfer from the training to the test stage were those with a relatively high *IQ*. A fourth issue which should be noted is the contrast between the results of Experiments 1 and 2. It would seem that, once sources of confounding are removed, only a fairly lengthy experimental procedure will reveal the operation of morphophonemic rules in young children. On all four counts, it must be concluded that the effects of internalizing Whorf-type morphophonemic rules are relatively weak. One reason may be that Whorf's rules have an *ad hoc* character, and it is usually impossible to find a principle predicting the permissibility or impermissibility of particular sequences of consonants. For example, if the consonant phonemes permissible in onsets before the phoneme "r" are listed, it is not possible to find a set of subphonemic features that differentiate the permissible from the impermissible set. Thus, all stops, both voiced and voiceless, are permissible, but of the permissible fricatives one is voiced and two are voiceless. Of the impermissible fricatives and affricates, five are voiced and three are voice-

less. Thus, there is no feature associated with mode or place of articulation that leads to the statement of a rule.

At the same time, it must be granted that the separation of 100 permissible consonant onsets from 14,424 possibilities represents the operations of a type of rule system, albeit a loose one. But it is probable that a number of factors, many of them associated with the history of English, have led to the development of the system, and it is unlikely that a majority of those factors could be coded as behavioral variables by a young child. On the other hand, as a result of his longer exposure to English, it would be expected that an adult would have coded the formal structure of morphophonemic rules into a set of behavioral variables. The results of studies on adults (2, 4) are, therefore, not surprising, while it is equally unsurprising that attempts to remove the sources of confounding from Messer's and Menyuk's studies should have resulted in the findings reported in the present study.

REFERENCES

1. BIJOU, S. W., STURGIS, P. T. Positive reinforcers for studies with children: Consumables and manipulables. *Child Devel.*, 1959, **30**, 151-170.
2. BROWN, R. W. Words and Things. New York: Free Press, 1958.
3. ———. Social Psychology. New York: Free Press, 1965.
4. BROWN, R. W., & HILDUM, D. C. Expectancy and the perception of syllables. *Language*, 1956, **32**, 411-419.
5. FERSTER, C. B., & APPEL, J. B. Punishment of S^A responding in matching to sample by time out from positive reinforcement. *J. Exper. Anal. Behav.*, 1961, **4**, 45-56.
6. HARLOW, H. F. Learning set and error-factor theory. In S. Koch (Ed.), *Psychology: The Study of a Science (Vol. 2)*. New York: McGraw-Hill, 1959. Pp. 492-537.
7. HAYDEN, R. E. The relative frequency of phonemes in general American English. *Word*, 1950, **6**, 217-223.
8. HOCKETT, C. F. A Course in Modern Linguistics. New York: Macmillan, 1958.
9. MENYUK, P. Children's learning and reproduction of grammatical and nongrammatical phonological sequences. *Child. Devel.*, 1968, **39**, 849-859.
10. ———. The Acquisition and Development of Language. Englewood Cliffs, N. J.: Prentice-Hall, 1971.
11. MESSER, S. Implicit phonology in children. *J. Verb. Learn. & Verb. Behav.*, 1967, **6**, 609-613.
12. MILES, R. C. Discrimination-learning sets. In A. M. Schier, H. F. Harlow, & F. Stollnitz (Eds.), *Behavior of Nonhuman Primates (Vol. 1)*. New York: Academic Press, 1965. Pp. 51-95.
13. MISHKIN, M., & PRIBRAM, K. H. Analysis of the effects of frontal lesions in monkeys: II. Variations of delayed response. *J. Comp. & Physiol. Psychol.*, 1956, **49**, 36-40.
14. NURSS, J. R., & DAY, D. E. Imitation, comprehension, and production of grammatical structures. *J. Verb. Learn. & Verb. Behav.*, 1971, **10**, 68-74.
15. RHEINGOLD, H., STANLEY, W. C., & DOYLE, G. A. Visual and auditory reinforcement

- of a manipulatory response in the young child. *J. Exper. Child Psychol.*, 1964, 1, 316-326.
16. SIMMONS, M. W. Operant discrimination learning in human infants. *Child Devel.*, 1964, 35, 737-748.
 17. WEISKRANTZ, L. On some psychophysical techniques employing a single manipulum. *Brit. J. Psychol.*, 1957, 48, 189-199.
 18. WHORF, B. L. *Language, Thought, and Reality*. New York: Wiley, 1956.
 19. ZIMMERMAN, J., & BAYDAN, N. T. Punishment of S_A responding of humans in conditional matching to sample by time-out. *J. Exper. Anal. Behav.*, 1963, 6, 589-597.

Department of Psychology

University of Saskatchewan

Saskatoon, Saskatchewan, Canada S7N 0W0

THE RELATIONSHIP BETWEEN CREATIVITY AND EGO DEVELOPMENT*

Western Carolina University

EDWARD A. WORKMAN AND JUDITH M. STILLION¹

SUMMARY

Fifty-eight female undergraduate students were administered the Torrance Tests of Creative Thinking (TTCT), Figural form B, and the Washington Sentence Completion Test in order to investigate the hypothesis of a positive relationship between creativity and ego development. A Spearman rank order correlation coefficient was computed for ego development and each TTCT creativity factor (fluency, flexibility, originality, and elaboration), as well as a total composite creativity score. All creativity scores correlated with ego development at the .01 level, except for originality, which correlated at the .05 level. Results were discussed in terms of Maslow's theories concerning highly developed persons, and possible preconscious aspects of the creative process. Conclusions were drawn, and recommendations for further research were made.

A. INTRODUCTION

Despite increasing research on creativity in highly developed (self-actualized) persons (8, 9), no studies, to date, have attempted to investigate the relationship between creativity and ego development. Jane Loevinger's theory of ego development (4, 5) provides an empirical and theoretical base for such investigations.

Ego is defined by Loevinger and Wessler (5) in terms of Sullivan's anxiety-gating theory (12); that is, the ego is one's frame of reference, which remains stable by means of selective inattention to experiences that are not in accord with its pre-existing state. Ego development can be conceptualized as an ongoing process which involves increasing degrees of integration of conflicting stimuli in the experiential field.

* Received in the Editorial Office on July 29, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Requests for reprints should be sent to the second author at the address shown at the end of this article.

Loevinger's model of ego development is hierarchic, having seven levels of development with several transition phases which mediate these levels. The levels of ego development that have been found to occur throughout the lifespan include the presocial/symbiotic, impulsive, self-protective, conformist, conscientious, autonomous, and integrated levels. The integrated level has been described by Loevinger (4) as being similar to what Maslow (7) has described as self-actualization. Each of the developmental levels is said to be characterized by a particular conceptual style, as well as by particular personality traits.

Previous research in creativity and personality has indicated several areas of personality functioning in which creative persons are similar to persons characterized by Loevinger as having high levels of ego development. Those characteristics of creative persons that are similar to the characteristics of highly developed persons in Loevinger's model include the creative person's (a) lack of conforming tendencies (2), (b) tolerance of ambiguity (1), (c) tendencies toward the reconciliation and integration of opposites (6), (d) higher degree of intraceptiveness (10), and (e) higher degree of self-actualization (8). Although creative persons and those persons with high levels of ego development do have personality characteristics that are common to both groups, this phenomenon alone does not warrant the conclusion that there is a positive relationship between creativity and ego development. The coincidence of these personality characteristics only indirectly supports the possibility of such a relationship. The purpose of the present investigation was to investigate directly the relationship between creativity and ego development.

B. METHOD

The subjects used in this investigation were 58 female undergraduate students from randomly selected general psychology courses at Western Carolina University. Ages ranged from 18 to 21 years. The Figural Tests (form B) of the Torrance Tests of Creative Thinking [TTCT (13)] and the Washington Sentence Completion Test (5) were administered to all subjects in order to measure creativity and ego development, respectively. A Spearman rank order correlation was computed for ego development and each of the creativity subscores on the TTCT (fluency, flexibility, originality, and elaboration), as well as a total composite creativity score.

C. RESULTS

The intercorrelations of the ego development scores with the TTCT creativity scores appear in Table 1. All correlation coefficients attained signifi-

TABLE 1
EGO DEVELOPMENT SCORE CORRELATIONS WITH SCORES ON TORRANCE TESTS OF
CREATIVE THINKING (TTCT) FOR 58 FEMALE COLLEGE STUDENTS

TTCT factor	
Fluency	.390**
Flexibility	.405**
Originality	.293*
Elaboration	.518**
Total creativity	.607**

* $p < .05$.

** $p < .01$.

cance at either the .05 or .01 levels. The correlation between originality and ego development attained significance at the .05 level, while all other correlations were significant at the .01 level.

The highest correlations obtained were between ego development and total creativity ($\rho = .607$) and between ego development and elaboration ($\rho = .518$). The correlation for the total creativity factor allows for the prediction of approximately 37% of the variance in ego development. The correlation for the elaboration factor allows for the prediction of approximately 27% of the variance in ego development. Although significant, those correlations below .50 tend to have little practical value in terms of prediction.

D. DISCUSSION

The results of this investigation tend to confirm the initial hypothesis of a positive relationship between creativity and ego development, since all creativity subscores, as well as total creativity, were significantly related to ego development. The results also tend to support Maslow's (7) contention that highly developed persons tend also to be highly creative.

It is interesting to note that these correlations were significant in spite of the following facts: (a) No student obtained an ego development score beyond the conscientious level, indicating that the highest levels of ego development had not been tapped; and (b) a relatively weak statistical procedure, at the ordinal level, was used.

Although the initial hypothesis was confirmed, the low correlation between originality and ego development indicates that factors other than those involved with ego functioning are involved in the generation of original material. The relatively low correlations between ego development and fluency, and between ego development and flexibility, may also indicate such a trend. It seems possible that elaboration involves that aspect of the creative process that results from the conscious manipulation of creative material and, hence,

is more strongly related to ego functioning. From this point of view, the results of this investigation tend to support Kubie's (3) contention that some aspects of the creative process involve preconscious components and are thus alien to the processes involved in ego functioning. In light of the fact that ego development and total creativity were highly related, while three of the aspects of creativity were only slightly related to ego development, it seems plausible to hypothesize that the "creative act" is more than a mere linear summation of the various aspects of the creative process (e. g., fluency, elaboration, etc.). That is, the discrepancy between the relatedness of the various aspects of creativity to ego functioning would seem to indicate that the creative process is a result of a dynamic interaction between the various aspects of creativity with both conscious (ego-related) and preconscious (ego-alien) components. Conscious and preconscious processes, then, interact in order to produce a result that is not accounted for by reference to either process alone.

E. CONCLUSIONS

The results of this investigation indicate that a positive relationship between ego development and creativity does exist. Two correlations, those between ego development and total creativity, and ego development and elaboration, were high enough to be of practical value in terms of prediction. The other three correlations were low but significant, indicating trends in the expected direction.

Further investigation of the relationship between the creative process and access to preconscious material seems highly desirable, as would the use of a larger number of subjects, including males and persons outside the college community. Finally, investigations that controlled on level of ego development and measured differences in creativity between defined groups would clarify the nature of the relationship between creativity and ego development.

REFERENCES

1. CROPLEY, A., & SIKAND, J. Creativity and schizophrenia. *J. Consult. & Clin. Psychol.*, 1973, **40**, 462-468.
2. EISENMAN, R., & CHERRY, H. Creativity, authoritarianism, and birth order. *J. Soc. Psychol.*, 1970, **80**, 233-235.
3. KUBIE, L. *Neurotic Distortion of the Creative Process*. Lawrence: Univ. Kansas Press, 1958.
4. LOEVINGER, J. The meaning and measurement of ego development. *Amer. Psychol.*, 1966, **21**, 195-206.
5. LOEVINGER, J., & WESSLER, R. *Measuring Ego Development: I. Construction and Use of a Sentence Completion Test*. San Francisco: Jossey-Bass, 1970.

6. MACKINNON, D. What do we mean by talent and how do we test for it? In *The Search for Talent*. New York: Coll. Entrance Exam. Board, 1960. Pp. 20-29.
7. MASLOW, A. *Toward a Psychology of Being*. Princeton, N. J.: Van Nostrand, 1968.
8. MAUL, T. An investigation of the relationship between self-actualization and creative thinking processes. Unpublished Doctoral dissertation, University of California, Berkeley, 1970.
9. MCCLAIN, E., & ANDREWS, H. Self-actualization among extremely superior students. *J. Coll. Student Person.*, 1972, **13**, 505-510.
10. PARLOFF, M. Creativity research program: A review. In C. Taylor (Ed.), *Climate for Creativity*. New York: Pergamon, 1972. Pp. 269-285.
12. SULLIVAN, H. S. *The Interpersonal Theory of Psychiatry*. New York: Norton, 1953.
13. TORRANCE, P. *Torrance Test of Creative Thinking: Norms-Technical Manual*. Princeton, N. J.: Personnel Press, 1966.

Department of Psychology
Western Carolina University
Cullowee, North Carolina 28723

THE EFFECT OF PRETESTING UPON THE RISKY SHIFT*¹

Western Michigan University

JAMES A. SCHELLENBERG

SUMMARY

The effects of pretesting upon group risk taking were investigated with 68 undergraduate sociology students. Comparisons were made of four treatment conditions: (a) with pretest and group discussion, (b) with pretest but without group discussion, (c) with group discussion but without pretest, and (d) with neither pretest nor group discussion. Posttest scores on choice dilemma questionnaire items showed a risky shift following group discussion, but failed to show any main effects of pretesting or any significant pretesting \times discussion interaction effects. These results fail to replicate the findings of Castore, but they are in harmony with other studies. It is concluded that effects of pretesting upon the group-induced shift toward risk are probably not substantial.

A. INTRODUCTION

Recently the study of the group-induced shift toward risk has been extended to consider the possible importance of pretesting.

First to report systematic study of pretesting effects were McCauley, Teger, and Kogan (3), who found that group decisions showed a significant shift to risk with either pretesting or familiarization procedures. Without a pretest, however, group risk scores or individual posttest scores in their study were not significantly different from pretest scores of subjects in the standard risky shift paradigm. Still, the trends of the no-pretest condition were in the direction of greater risk following group discussion, leading the authors to conclude that "absence of the pretest, if it makes any difference at all in the nature of the risky shift, is not making a major difference" (3, p. 381).

* Received in the Editorial Office on August 2, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research was facilitated by the cooperation of Subhash Sonnad and Paul Wienier in planning the experimental setting and by the following assistants who ran experimental sessions: Paul Basing, Victoria Davis, Claudia Holtrop, Mary Beth Mahoney, Kathleen Mistelet, Mary Pohutsky, Philip Smith, and Michael Troost.

In contrast, Castore (1) found evidence of increased risk following discussion only in treatments with pretests. Postdiscussion scores of individuals in no-pretest conditions were essentially the same as pretest scores in those conditions with pretests. The strength of the pretest effect was sufficiently strong to lead Castore to conclude that "the risky shift, as obtained in the standard experimental paradigm with standard procedures, is most aptly attributed to an interaction between the prediscussion assessment process and the effects of group discussion" (1, p. 165).

Gaskell, Thomas, and Farr (2) used experimental treatments of either group discussion or individual familiarization, each either with or without pretesting. Their results indicate that pretesting induces a cautious bias in posttest scores with the treatment of individual familiarization. However, pretesting appears not to affect significantly a shift toward risk following group discussion.

All of the sources cited above referred to Solomon's pioneering efforts to control for pretesting effects (5); and Castore (1) and Gaskell *et al.* (2) used adaptations of the Solomon four-group design. But none of these studies used the most direct application of the Solomon design: namely, the creation of four treatment groups—with pretesting and group discussion, with pretesting but without group discussion, with group discussion but without pretesting, and with neither group discussion nor pretesting. Comparison of final risk scores for these four treatments should clarify rather directly the role of pretesting in the group-induced shift toward risk. This proposed clarification is essentially the rationale for the present study.

B. METHOD

1. Design

As just indicated, there were four basic experimental treatments constituting a 2×2 factorial design based upon either presence or absence of group discussion and presence or absence of pretesting. This design had four treatment groups: (A) with pretesting and group discussion, (B) with pretesting but without group discussion, (C) with group discussion but without pretesting, and (D) with neither group discussion nor pretesting.

Items 1, 2, 3, 4, and 10 of the Choice Dilemma Questionnaire (4, pp. 359-360) were used for group discussions. Items 5, 6, 7, 9, and 11 were not discussed, but were used (along with the discussed items) in posttests and, where applicable, in pretests. In what follows we will refer to the discussed items (1, 2, 3, 4, and 10) as Set X and the other items (5, 6, 7, 9, and 11) as Set Y.

2. *Subjects and Procedures*

Subjects were 68 students of an introductory methods class in sociology at Western Michigan University. Students of each of three class hours were randomly assigned to the four treatment groups. They participated in the experiment before taking up the topic of experimental design, where it was discussed as an example.

A total of 101 subjects had filled out initial materials (pretest or substitute questionnaire), but only 85 of these were present two days later when group discussions (where applicable) and posttests were held. Subjects in non-discussion treatments simply took the posttest questionnaire at this time. Seventeen of the 85 subjects taking part in both experimental sessions were dropped to balance the number of subjects in each treatment group.

For the group discussions, individuals were given the cases of Set X to discuss and "try to come to a consensus as a group" regarding the preferred risk level. However, no actual recordings were made of group decisions. Groups had 30 minutes to discuss the five cases; then they were given the posttest and told to give "your own individual answers concerning how you see these, regardless of the conclusions your group may have reached in items just discussed."

C. RESULTS

Given random assignment of subjects to treatment conditions, an analysis of variance of posttest scores is the most direct way of examining the relative effects of pretesting and group discussion. In a 2×2 factorial (discussion \times pretesting treatments) analysis of variance of summed risk scores for discussed items (Set X), a main effect was found for group discussion ($F = 9.47$, $df = 1$, $p < .01$). This is in the direction of more risky positions following discussion. There is no similar effect for Set Y, the items not discussed ($F = .55$). For neither the discussed or not discussed sets of items was there a main effect for pretesting (with F values of .02 and .01, respectively), nor did either show a significant discussion \times pretesting effect ($F = 3.41$ for Set X; $F = .60$ for Set Y).

Examining pretest as well as posttest scores, we found that for Set X both conditions involving a pretest moved in the direction of greater risk, while for Set Y the direction was toward less risk. When we examined data for individual subjects, we found that for Condition A (pretest and discussion) 11 (of 17) subjects shifted to greater risk on Set X, while only five did so on Set Y. For Condition B (pretest only) 10 (of 17) subjects shifted to greater risk on Set X, while six did so on Set Y.

D. DISCUSSION

Is there a risky shift following group discussion? Yes, the present data appear to support further this already well-documented finding.

Does the risky shift require pretesting? Castore (1) suggests that pretesting is a necessary part of the procedures producing the risky shift; however, the present study fails to replicate Castore's findings in this respect. Posttest scores tended to show higher risk following group discussion without pretest than following pretest and discussion.

What, then, is the effect of pretesting? Probably not much, if we are to base our conclusions on the present study. If we are to combine the evidence of previous studies of effects of pretesting with our own, we may note that only Castore (1) found substantial evidence for interaction effects involving pretesting and discussion. The present study is much more in line with the results reported by McCauley *et al.* (3) and Gaskell *et al.* (2). Altogether, then, the present study might well support a cautious bias into our interpretation of pretesting effects. Unless further studies demonstrate a much greater impact, we should doubt any general and systematic effect of pretesting—either by itself or in interaction with group discussion.

REFERENCES

1. CASTORE, C. H. Group discussion and prediscussion assessment of preferences in the risky shift. *J. Exper. Soc. Psychol.*, 1972, 8, 161-167.
2. GASKELL, G. D., THOMAS, E. A. C., & FARR, R. M. Effects of pretesting on measures of individual risk preferences. *J. Personal. & Soc. Psychol.*, 1973, 25, 192-198.
3. MCCAULEY, C., TEGER, A. I., & KOGAN, N. Effect of the pretest in the risky-shift paradigm. *J. Personal. & Soc. Psychol.*, 1971, 20, 379-381.
4. PRUITT, D. G. Choice shifts in group discussion: An introductory review. *J. Personal. & Soc. Psychol.*, 1971, 20, 339-360.
5. SOLOMON, R. L. An extension of control group design. *Psychol. Bull.*, 1949, 46, 137-150.

Department of Sociology
Western Michigan University
Kalamazoo, Michigan 49001

STATUS COMPARABILITY AND ATTITUDES TOWARD A FOREIGN HOST NATION: A CROSS-CULTURAL STUDY*

Department of Psychology, University of Pennsylvania

CHARLES A. SALTER¹

SUMMARY

An investigation was made of four models of the effects of status inter-relationships during an overseas sojourn on the attitudes toward the nations visited. Questionnaires were given to 158 Ss in four groups (all groups included roughly 70% males and 30% females): Italian overseas and control groups, and American overseas and control groups. For overseas Italians, superiority to the reference group in terms of prestige, intellectual, and mean status was a significant predictor of attitudes. For overseas Americans, merely present status, devoid of a referent, was significant, but only with attractiveness status. The equal status principle and status gain models were not significant with either group. Of nonstatus variables, the most significant correlate for both groups was satisfaction with the entertainment facilities. The cross-cultural similarities supported social exchange theory, and the differences supported popular stereotypes of the two cultures and a field theoretical position on insecurity reduction.

A. INTRODUCTION

Little is known about the conditions under which cross-national contact leads to favorable or unfavorable attitudes toward the countries visited. In general, the answer of social exchange theory (15) is that the hedonic consequences of a trip will determine these attitudes. That is, whatever contributes to a more satisfying overseas sojourn will result in more positive attitudes toward the countries visited, and whatever leads to a more dissatisfying experience will result in more negative attitudes.

* Received in the Editorial Office, Provincetown, Massachusetts, on August 5, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The author wishes to thank Drs. Allan Teger, Albert Pepitone, and Robert Kraut for several invaluable suggestions, and Dean Robert McNamara for permission to study the Loyola Rome Program. This study was supported by the Social Science Research Grant, number T01 MH12529, and was part of a dissertation submitted for the Ph.D degree in psychology at the University of Pennsylvania.

A particular source of hedonic rewards which is exemplary of the entire list of sources is status, which may be defined as one's relative position on a superiority-inferiority scale (4). Sherif and Sherif (14) point out that the variable of status is absolutely essential to get "a proper perspective toward the stimulus situations individuals face" (14, p. 623). And Morris (8, p. 4) maintains that "the experience of status shock and increased concern and awareness of status seem universal" among foreign students. This is hardly surprising, for status is one of the most important dimensions of social life in general, and the most subject to change as a person leaves one relatively stable social hierarchy and seeks to find his slot in a totally new and different one.

The problem in applying this social exchange theoretical framework to status is that what is rewarding to one individual may not be so to another. Consider, therefore, four different models of the operation of status which have been proposed.

1. *Models of Status*

a. Equal status model. Allport (1) theorized that attitudes between two groups could be enhanced only if contacts between them were of equal status. The general consensus now (2) is that only the status within the contact situation itself must be equal, not necessarily status outside the situation. Equal status, according to this model, promotes interaction and the kind of "true acquaintance" which improves attitudes. International contact between persons or groups of unequal status leads to no attitude change at best, and more often negative change, because unequal status sets up divisive frictions.

b. Status change model. This model depends on the comparability of one's status in the new culture to his former status in the old home culture. According to Thibaut and Kelley (15), one's own prior social rewards are the basis for his comparison level (CL), a type of expectation used for evaluating the rewards present in the new situation. According to gain-loss theory (3), the larger the status gain, the more the satisfaction and hence positiveness of attitudes; the larger the status loss, the more the dissatisfaction and hence negativeness of attitudes towards the host nation.

c. Reference group model. As Sherif and Sherif (14, p. 628) define this concept, "Reference groups are those groups to which the individual relates himself as a part or to which he aspires to relate himself psychologically." Although present physically in the host nation, a foreign student could cling psychologically to the peers in his home nation as a reference group (9). Or, conversely, the international visitor may try very hard to become a part

of the host culture, indicating that his peers in the host country comprise his reference group. Whichever one it is, the reference group provides standards by which the level of social rewards, including status, can be judged (7). The farther a person's rewards falls below his reference group's average, the more dissatisfied he will be, and the more negative his attitudes toward the host nation. Conversely, the higher above this average his rewards fall, the more positive his feelings and attitudes. The comparability of his level of rewards to other groups which are not salient as reference groups for him will not affect his attitudes.

d. *Status outcome model.* In denying the importance of comparisons to other standards, this model is in a sense a null hypothesis. It maintains that what is most satisfying, and results in the most positive attitudes towards the host nation, is merely one's present overall level of status. That is, this model predicts a straight correlation between ranking in the status hierarchy within a given host nation and attitudes toward that nation.

Perhaps the exact differences among the four models can be made more clear by an example. Take the cases of an American student working in Italy at a job of lower status than he is familiar with at home, an American tourist splurging beyond his usual means in Italy, and a poor immigrant from India finding a higher standard of living in Italy. The equal status hypothesis predicts that the American student and Indian immigrant will have more positive attitudes toward Italy than the tourist, because they are of equal status with their hosts. On the contrary, the status change model predicts more negative attitudes for the American student in that he sustained a loss of status, regardless of how equal to his hosts he thereby became. If the American tourist and the Indian immigrant both gained equally over their own pasts, they would have equally high attitudes according to this model. The reference group model, on the other hand, asserts that if the Indian immigrant felt securely superior to a reference group of poverty stricken peers at home, he might have more positive attitudes than the American tourist who somehow felt inferior to the status which he imagined accrued for the "rich American tourist" overseas. The status outcome model would predict just the opposite—that whatever their comparability to other groups, the tourists would currently have higher status, and thus higher attitudes toward Italy, than the immigrant.

2. Cross-Cultural Differences

Given that status is multidimensional, then the aspects of status that concern overseas Americans might be different from those of concern to overseas

Italians. Morris (8) reported that status concern is universal among foreign students, and it seems plausible that this concern is primarily about dimensions of status in which the host culture is perceived to be superior to one's own home culture. Karlins, Coffman, and Walters (6) reported that American students perceived Italians to be primarily passionate, pleasure loving, artistic, impulsive, and loyal to family ties, in that order. They perceived themselves to be primarily materialistic, ambitious, pleasure loving, industrious, and intelligent, in that order. To the extent that these stereotypes are accurate, it is hypothesized that Americans in Italy might feel inferior in terms of attractiveness status or cultural status, and be most concerned with those dimensions. On the other hand, Italians in the United States might feel inferior to Americans in regard to economic, intellectual, and prestige status, and be themselves primarily concerned with those dimensions.

Concerning the status models, even though the equal status principle has been popular, recent research (12) has suggested that superiority rather than equality leads to more positive attitudes. It is hypothesized that Italians depend more on their reference groups, since they are more family oriented and other-oriented in general. Conversely, Karlins, Coffman, and Walters (6) found that Americans consider themselves more individualistic. For them, the status change or the status outcome model might be more important, since these two rely only on one's own standards rather than those of a group.

B. METHOD

1. *Subjects*

Group I consisted of 44 American students from Loyola University of Chicago studying at the Loyola Center in Rome. Group II, the American control group, consisted of 37 Loyola students still in Chicago, but accepted into the Rome program for the following year. Group III consisted of 32 Italian students attending Northern American universities in Chicago (three Ss), New York (19 Ss), and Boston (10 Ss). The Italian control group, Group IV, consisted of 45 Italian students in Rome who were learning English at the Loyola Rome Center and had an interest in coming to the United States. These two control groups were chosen because they equated experimental and control Ss with respect to interest in the foreign country, thus ruling out the problem of self-selection effects between groups. In all groups combined there were thus 158 Ss, and in all groups there were roughly 70% male subjects and 30% female subjects.

2. Questionnaires

All four groups received precisely the same 12-page questionnaire, except that the wording was appropriately adjusted to each group's situation. In the case of the question about educational quality in the host country, for example, the two overseas groups were asked what level of educational quality they were then experiencing, and the two control groups were asked what level of educational quality they expected the following year in the host country.

The dependent variable was measured by three questions about Ss' attitudes toward the host country in general, the host people, and the host lifestyle. There were seven dimensions of status measured in the questionnaire—those which Hyman (5) discovered Ss say they use in making status judgments. Each was measured by two questions, one on a nine-point scale and the other a codable free response. These questions were on *education*—the quality and the amount of education; *attractiveness* to the opposite sex—*attractiveness* and the number of dates per month; *culture*—the amount of knowledge of and the frequency of discussion on cultural matters; *respect and prestige*—how much respect received and how often complimented; *social standing* with the same sex—how often met with same sex friends per week and how easily friends were made; *economic standing*—the amount of spending money, money for room and board, and the standard of living; and on *overall social status*.

Within each dimensional question there were five subquestions in which S gave his perception of relative status. Part A concerned his own past level of status at home; Part B was about the fellow nationals he knew who were still at home; Part C was about that of the host nationals he then knew in his host country; Part D concerned his own current level of status in the host country; and Part E dealt with the status of his fellow nationals he currently knew in the host country.

Three questions were used to determine which possible group each S used as his reference group. For each question, S was instructed to choose one of three likely groups (as reflected in Parts B, C, and E), or to describe some other group he had chosen. One question asked S to choose which group he most wanted to belong to; another, which one he evaluated his behavior by; and the third, which one he used for comparing his situation and achievements (7). A total score of two choices or better was taken as a measure that a given group was the S's primary reference group.

Ss were also given some of Rotter's (10) key Internal-External items, and

asked how long they had been in the host country, how well they spoke the language, how much they had travelled in the past, and how satisfied they were with the entertainment facilities.

3. Procedure

Questionnaires were mailed to potential Ss in Groups II and III in the United States, and at the same time, E went to the Loyola Rome Center to administer questionnaires to Groups I and IV there. In every case, the Ss were informed that university officials had given permission and encouraged participation, and that their anonymity was guaranteed. The possibility of prior knowledge about the questionnaire was minimized, two appeals were given (except for Group IV), and all Ss were paid 800 lira or \$1.50. In all cases, Ss filled out the questionnaires themselves: i.e., the groups in Italy were not individually interviewed by E. And response rates were strikingly similar—and acceptably high—for all groups, ranging from 64% to 69%.

C. RESULTS

1. Comparability of Italian Overseas Subgroups

Italian students in three highly similar Northern American cities were selected as Ss. In order to verify the similarity of these three subgroups, the differences among them on the 14 status and seven other key variables (age, time in U.S., facility with English, three attitude items, and mean attitude) were analyzed. Of 63 pairwise *t* tests, only two were statistically significant at the $p < .05$ level of probability, and visual inspection of the differences revealed that all three subgroups were reasonably similar to each other. Thus combining them into one group seemed justified on the basis of both face validity and empirical data.

2. Definition of Status

The technique of factor analysis was employed to see which, if any, of the 14 status variables clustered together to form empirically distinct subsets or dimensions of status. Preliminary analysis revealed that four factors would be the best solution. Since the American and Italian factor analyses (done separately at first) were so similar, ideal status factors were derived by taking those dimensions that were common to a given factor in both cultures and/or those that by face validity belonged with a given conceptualization. Thus the ideal *prestige* factor was composed of ease in making friends, magnitude of respect, and overall social status—the three in common in

both the American and Italian prestige factors. For the component variables of the other three factors, see Table 1. One item, educational quality, was eliminated because it was not related to other intellectual dimensions in either the American or Italian factor analyses.

As a check on the validity of these ideal status factors, factor scales were computed by taking a mean over the component variables of each factor, and intercorrelations between the status variables and these factor scales were computed (see Table 1). The first part of Table 1 shows that the component variables were highly correlated to their corresponding factors, and considerably less correlated with the other factors. The second part of this table indicates that the status factors were reasonably independent of each other. That many variables from different factors were correlated with each other indicates the general interrelatedness of status dimensions. However, the four ideal factors appeared to be reasonably distinct dimensions of status,

TABLE 1
INTERCORRELATION OF STATUS VARIABLES AND
IDEAL STATUS FACTORS ALL GROUPS (158 Ss)

Status variable:	Ideal status factor			
	Prestige	Economic	Intellectual	Attractiveness
Amount of respect	0.75***	0.18*	0.23**	0.17*
Ease making friends	0.81***	0.02	0.28***	0.09
Overall status	0.68***	0.24**	0.16	0.08
Living standard	0.28***	0.56***	-0.06	0.21**
Room and board	-0.06	0.59***	0.04	0.23*
Spending money	0.12	0.77***	0.05	0.01
Years education	-0.28***	0.02	0.16	0.05
Culture knowledge	0.37***	0.10	0.48***	0.15
Freq. culture discussion	0.27***	-0.04	0.68***	0.06
Freq. same sex meeting	0.26**	-0.05	0.69***	0.03
Attractiveness	0.17*	0.03	0.02	0.51***
Number of dates	-0.05	0.19*	0.05	0.76***
Freq. of compliments	0.28***	0.11	0.24**	0.65***
Educational quality	0.25*	0.05	0.01	0.13
Ideal prestige factor	1.00	0.16*	0.30***	0.15
Ideal economic factor	0.16*	1.00	-0.02	0.19*
Ideal intellec. factor	0.30***	-0.02	1.00	0.14
Ideal attract. factor	0.15	0.19*	0.14	1.00

Note: Underlined columns of correlations refer to those between a given status factor and its component variables.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

and they were used in subsequent analyses with attitudes toward the host country.

For the cross-cultural differences in standing on these different status factors, see Table 2. According to their own self-report, Italians expected and received less prestige ($p < .001$) and intellectual ($p < .006$) status in the United States than did their American counterparts in Italy. Similarly, Americans expected and received less attractiveness ($p < .028$) status in Italy than did Italians in the U.S. This paralleled exactly Karlins, Coffman, and Walter's (6) differences in stereotypes of the two cultures.

3. *Differences in Attitude Before and After Cross-Cultural Contact*

Table 2 also reveals that mean attitudes toward the host country rose slightly after experience there, but not to a significant extent. Actually, before-after t tests revealed that Americans' mean attitudes toward Italy became enhanced almost to a significant extent ($p < .06$), whereas Italians' mean attitudes toward the U.S. changed only slightly ($p < .5$). This could indicate either that such cross-national encounters have no real impact on attitudes, or that the present control groups had access to enough information to be already developing "appropriate" attitudes toward the host country before going over.

4. *Status Models and Attitudes*

Testing the four models of status necessitated certain data manipulations. Ss' present standings on all 14 dimensions of status were combined into a mean present status scale, to test the status outcome model. For the other models, a subtraction had to be carried out for each dimension between the S's current status and that of his own past (for the status change model), his hosts (for the equal status model), and his chosen reference group (only for those Ss with a clear choice of one). A mean was then taken over all 14 differences. Correlations were computed between the resultant four mean scales and mean attitudes for each overseas group as a function of each status dimension.

a. *Italians in the United States.* Of the 32 Ss in this group, 19 met the criterion of a clear reference group choice: 9 (47%) chose their hosts, 5 (26%) chose their fellow countrymen at home, and 5 (26%) chose their fellow countrymen with them in the United States. In terms of overall status, the reference group model produced a correlation of .54 ($p < .05$), and the status change model produced a correlation of .35 ($p < .05$) with attitudes. The reference group model, therefore, accounted for 29% of the

TABLE 2
ANALYSIS OF VARIANCE BY NATIONALITY AND OVERSEAS EXPERIENCE
ON THE STATUS FACTORS AND MEAN ATTITUDES

Variable	U.S. control	U.S. overseas	Italian control	Italian overseas	Significance level of		A × B
					Nation (A)	Exper. (B)	
Mn. att. of host	6.54	7.02	5.10	5.26	.001	.174	.487
Ideal prestige factor	6.83	6.81	6.02	6.06	.001	.500	.500
Ideal economic factor	4.55	5.41	5.32	5.65	.013	.004	.188
Ideal intellec. factor	5.99	5.84	5.50	5.39	.006	.437	.500
Ideal attract. factor	5.29	5.49	5.56	6.25	.028	.059	.291

Note: All means are based on a nine-point scale where 1 = low and 9 = high. For the status factors control Ss indicated what they expected to find the host country, while cross-cultural Ss reported what it was actually like. For attitudes towards the other country, all Ss indicated their present standing.

variance in attitudes, more than twice as much as any other model did. Although the status change model did correlate significantly with attitudes, it also correlated .56 ($p < .05$) with the reference group model. This covariance indicated that the status change model added little to the total proportion of variance accounted for.

Separate analyses were computed for each ideal status factor as well. Two factors, the economic and attractiveness ones, were not at all significant, whereas the prestige and intellectual factors were relatively important in accounting for attitudes toward the United States. These two correlated with the reference group model .58 ($p < .01$) and .48 ($p < .05$), respectively, and were precisely those about which Italian Ss reported that they expected and received less status than the American Ss did (see Table 2). Thus, on the basis of the present data, the Italian student in the United States had the most positive attitudes toward his country when he exceeded his reference group in regard to prestige and intellectual considerations.

b. Americans in Italy. Of the 44 Ss in this group, 38 had a clear choice of reference group. Twelve (32%) chose their fellow countrymen at home, and 26 (68%) chose their fellow countrymen with them in Italy. Unlike the Italian sample, the American overseas group had no significant correlations between the models and attitudes with overall status. Examination of the correlations with each status factor separately, however, showed that the importance of status for Americans cannot be ruled out. With the attractiveness status factor, the one about which Americans as a cultural group reported receiving less status than the Italians reported getting (as shown in Table 2), the status outcome model correlated .34 ($p < .025$) with attitudes, thus explaining 12% of that variance. This means that Americans who were enjoying a relatively high level of attractiveness status in Italy had the most positive attitudes toward that country.

5. Other Variables and Attitudes

Since status did not account for all the variance in attitudes toward Ss' hosts, it was necessary to determine whether other variables might also correlate (see Table 3). For the American overseas group, two of these variables were statistically significant: frequency of entertainment—.30 ($p < .05$), and satisfaction with the entertainment facilities—.46 ($p < .01$). These two variables correlated similarly within the Italian overseas group, except that only satisfaction with entertainment (.42) was significant ($p < .05$).

TABLE 3
CORRELATION OF OTHER VARIABLES WITH MEAN ATTITUDE
IN OVERSEAS GROUPS

Variables	Correlation with mean attitude	
	Group I-Americans in Italy (44 Ss)	Group III-Italians in U.S. (32 Ss)
Internal-external	— .15	.24
Time in host country	.16	— .06
Entertainment frequency	.30*	.26
Satisfaction with entertainment	.46**	.42*
Frequency of prior national travel	— .04	— .23
Frequency of prior international travel	— .07	— .17
Facility with host language	.05	— .07
Relations between U.S. and Italy	.12	— .01

* $p < .05$.

** $p < .01$.

D. DISCUSSION

1. *Definition of Status*

Beginning with 14 items based on Hyman's (5) seven dimensions of status, the factor analyses for both the Italian and American samples produced the four independent factors of economic, intellectual, prestige, and attractiveness status. Why was this different from Benoit-Smullyan's (4) classic trichotomy into economic, prestige, and political status, which is still lodged in contemporary thinking? Probably, these four dimensions appeared because they are the ones of most consequence to university students. At college, in addition to prestige and economic status, one is very alert to intellectual standing: e.g., grades, and standing with the opposite sex—e.g., frequency of dates. These factors are probably less important in the general adult population, being superseded by political status, and for them, perhaps, Benoit-Smullyan's trichotomy is more appropriate. Thus it appears that status conceptualizations reflect the needs and experiences of the Ss involved. This should caution us against attempting to oversimplify status into purely economic or other unidimensional terms.

2. *Status and Attitudes*

The results of this study indicated cross-cultural support for the hypothesis that status in a foreign country is an important element of satisfaction and attitudes toward that country. Different status factors were significant for each group, but in both cultures the significant factors were those about

which S's cultural group expected and received less status than the other group did. It was as if Ss feared less via their identification with an "inferior" group (on the given dimension), but when they themselves did well, then their insecurity was relieved and they had positive attitudes toward the host country in which they were enjoying the relatively high status.

This interpretation ties in nicely with field theory (13). The unfulfilled need has the greatest tension in the life space, and the individual tries to bring a region about which he is concerned up to the level of the surrounding regions. The consequent tension release is quite satisfying.

An alternative explanation would postulate that the group receiving less of a particular kind of status merely suffered from relative deprivation rather than insecurity. With expectations in that area being low, the positive rewards received seemed all the better because of contrast effects. This interpretation is more in line with Aronson and Linder's (3) gain-loss theory: i.e., the positive rewards have a greater effect on attitudes precisely when they have been preceded by lower rewards, or even costs. But whatever the interpretation, these results supported the hypotheses based on Karlins, Coffman, and Walters' (6) study of stereotypes, thus indicating the effect of stereotypes on expectations and evaluation of outcomes during international exchange.

In contrast to the above cross-cultural similarities in the statistical significance of status and in the selection of relevant status dimensions, there was one large cross-cultural difference in the use of status. The reference group model was the most significant for the Italians, while the status outcome model was for the Americans.

A possible explanation takes note of differences in current cultural mores. Among American university students, the prevalent mood is that each person "has his own bag" and should "do his own thing." It is considered gauche to compare oneself to others or to accept others' standards for oneself. Instead, each person is exhorted to look into himself for his standards and be true only to his inner-directed calling. Small wonder, then, that comparisons to reference groups mattered little to the American Ss in this study. For them, simply the status outcomes were important: i.e., just the level of attractiveness status they were currently enjoying.

Conversely, Italian young people to a greater extent still cling to a heritage of being family-oriented and other-oriented in general. For them, tradition and what others think is more important, and comparisons with others are thus significant. But this is not an indiscriminate thing, but depends on comparability to the specific groups which are individually most salient for them. Thus Italians depended more on comparability to their reference

groups, and Americans depended more on status outcomes, *per se*, devoid of an external referent. It is also interesting to note that although the equal status model has been popular for a long time, in both cultures examined here superiority led to higher attitudes than did equality, a finding further supported by Salter and Teger (12).

3. Other Variables and Attitudes

Somewhat surprisingly, most of the nonstatus variables did not significantly correlate with attitudes. But just as Salter and Salter (11) reported earlier, satisfaction with entertainment facilities was a primary correlate in both cultures studied here. Why should satisfaction with entertainment facilities so predominate?

Karlins, Coffman, and Walters (6) found that "pleasure loving" was the stereotype assigned second in frequency to Italians and third in frequency to Americans. Thus in both cultures the pursuit of pleasure seems to be a primary source of satisfaction and a relatively easy mode of cultural adjustment. For the students in the present samples, involvement in the other culture's educational sphere was not intrinsically rewarding. Actually becoming immersed in the alien culture and really moving out to get to know people was difficult. Thus facility with the host language was not very important, nor the amount of time spent in the host country, within the short range characterized by students. (With adult immigrants, however, time in the wider range might be extremely important.)

A mode in which adjustment is easy, especially in shorter stays, is the entertainment facilities. Entertainment is a common denominator within the cultures of these studies. With little social cost, one can enjoy a park, a dance, or a nightclub in Italy just as easily as he can at home. Moreover, the illusion of really immersing oneself in a foreign culture is provided. Perhaps this is why satisfaction with entertainment was such an important variable, because it was the easiest mode of adjustment—the easiest source of positive hedonic consequences at the lowest social cost.

REFERENCES

1. ALLPORT, G. W. *The Nature of Prejudice*. Cambridge, Mass.: Addison-Wesley, 1954.
2. AMIR, Y. Contact hypothesis in ethnic relations. *Psychol. Bull.*, 1969, **71**, 319-342.
3. ARONSON, E., & LINDER, D. Gain and loss of esteem as determinants of interpersonal attractiveness. *J. Exper. Soc. Psychol.*, 1965, **1**, 156-171.
4. BENOIT-SMULLYAN, E. Status, status types, and status interrelations. *Amer. Sociol. Rev.*, 1944, **9**, 151-161.
5. HYMAN, H. H. The psychology of status. *Arch. Psychol.*, 1942, Whole No. 269, 1-94.

6. KARLINS, M., COFFMAN, T. L., & WALTERS, G. On the fading of social stereotypes. Studies in three generations of college students. *J. Personal. & Soc. Psychol.*, 1969, 13, 1-16.
7. KELLEY, H. H. (1947). Two functions of reference groups. In H. H. Hyman & E. Singer (Eds.), *Readings in Reference Group Theory and Research*. New York: Free Press, 1968. Pp. 77-83.
8. MORRIS, R. T. The Two-way Mirror: National Status in Foreign Students' Adjustment. Minneapolis: Univ. Minnesota Press, 1960.
9. POOL, I. DE S. What American travellers learn. *Antioch Rev.*, 1958, 18, 431-446.
10. ROTTER, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychol. Monog.*, 1966, 80, Whole No. 609.
11. SALTER, C. A., & SALTER, C. D. International contact, social rewards, and attitudes toward the country visited. *Psychol. Reports*, 1974, 35, 49-50.
12. SALTER, C. A., & TEGER, A. I. Change in attitudes towards other nations as a function of the type of international contact. Paper presented at the meeting of the Eastern Psychological Association, Boston, April, 1972.
13. SHAW, M. E., & COSTANZO, P. R. *Theories of Social Psychology*. New York: McGraw-Hill, 1970.
14. SHERIF, M., & SHERIF, C. W. *An Outline of Social Psychology*. New York: Harper, 1956.
15. THIBAUT, J. W., & KELLEY, H. H. *The Social Psychology of Groups*. New York: Wiley 1959.

Department of Psychology
Spring Hill College
Mobile, Alabama 36608

THE IMPACT OF GROUP THERAPY ON PENITENTIARY VOCATIONAL AND ACADEMIC EDUCATION PROGRAMS*^{1 2}

*Faculty of Business Administration and Commerce,
The University of Alberta, Canada*

ALBERT N. B. NEDD AND EMILE S. SHIHADDEH³

SUMMARY

The effects of participation in group therapy on inmates' perception of a penitentiary academic and vocational education programs were studied. Subjects were 175 inmates of a Canadian penitentiary. It was hypothesized that participation in group therapy would heighten inmates' perception of the utility of vocational training as a rehabilitative device but would have no effect on their perceptions of utility of academic education.

Results indicate that group therapy assisted in developing more positive attitudes among inmates towards vocational training, but had no effect on their low evaluation of academic education. Actual participation in programs, through the operation of pressures to reduce cognitive dissonance created by such participation, was more effective in creating positive evaluations in the case of academic education than in the case of vocational education.

A. INTRODUCTION

Several criminologists have observed that vocational and academic education programs have become part of the stock in trade of penitentiaries in their efforts to bring about the effective rehabilitation of criminals. Ohlin (4, p. 65) for example, observes that "correctional institutions are changing from relatively simple institutions with punishment, custody, and security as objectives to much more complex organizations with such difficult goals as vocational training, education, and personality and value reorganization

* Received in the Editorial Office, on August 5, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This study was partially supported by a grant from the Solicitor-General's Department, Ottawa.

² The authors acknowledge their special debt to Dale H. Bent of the University of Alberta, for his assistance in the data analysis phases of this research.

³ Albert N. B. Nedd is a Visiting Associate Professor at Cornell University and Emile S. Shihadeh is a Professor at the University of Alberta.

superimposed on the older custodial expectations." As this quotation indicates, prisoners are subjected to a package of correctional techniques in the effort to reform them. It, therefore, is more meaningful to investigate the effectiveness of various combinations of penitentiary programs, rather than that of any particular program, in attaining the goals of the penitentiary. This study is an attempt to compare the interactive effects of group therapy on the academic and vocational education programs of a penitentiary.

B. CONCEPTUAL FRAMEWORK

It is helpful in discussing the impact of penitentiary programs on the attitudes and behaviors of criminals to make a distinction between the goal of rehabilitation and that of resocialization. This distinction becomes particularly important when the differential responses of prisoners to academic and vocational education programs are considered. Galtung (2) has observed that resocialization implies rehabilitation, but the converse need not be true. If a released convict does not commit a crime, rehabilitation is said to have taken place. Although he may have gone straight because he did not have an opportunity to commit a crime, rather than because he was motivated to change his ways, rehabilitation is assumed to have occurred. The motives of the criminal are deemed irrelevant. Motive, however, is crucial in determining whether resocialization has occurred. The criminal can only be said to have been resocialized if he did not commit a crime, when there was ample opportunity to do so, because he perceived such behavior to be repugnant to his newly acquired system of values.

It seems that vocational training and academic education are unlikely to be equally effective as techniques for changing individual criminals. The criminal may share the value that members of the law-abiding society attach to general education. Cressey (1) suggests that his participation may simply indicate a desire to escape from the restrictions of an uneducated person rather than the change of attitudes which resocialization implies. He observed that similar conclusions can be arrived at with respect to participation in a program of vocational training. However, there are cogent arguments for assuming that vocational training, used in conjunction with other correctional techniques, such as group therapy, has greater potential than academic training for bringing about the resocialization of the criminal.

Gibbons (3) has argued that the change of attitude that constitutes rehabilitation is best facilitated by involving the offender in a form of group therapy, in which the approach is to change group attitudes by encouraging offenders to exert pressure upon each other to exhibit prosocial views. Other

writers on the subject support this suggestion. Cressey (1), for example, points out that training men to be bricklayers will not automatically convert criminals into noncriminals. Such courses are correctional, only to the degree that they change inmates' postrelease associations. He implies that some form of group therapy will facilitate this; but, as we have already observed, he also suggests that group therapy will have similar impact on the effectiveness of academic, as well as, vocational education. This study was an attempt to test this hypothesis in the setting of a medium security Canadian penitentiary.

The general assumption underlying this study is that participation in penitentiary programs generally leads prisoners to acquire more favorable views of the utility of these programs. Elsewhere we have shown that a useful way of evaluating the "participation effect" is to ascertain whether participation renders prisoners' perception of the programs as favorable as those of the penitentiary staff (5, 6). The assumption that participation has a beneficial impact on prisoners' attitudes toward penitentiary programs underlies our first two hypotheses which may be stated as follows:

Hypothesis 1: Participants in academic and vocational educational programs will have more favorable perceptions of the utility of these programs than nonparticipants.

Hypothesis 2: Participants in the academic and vocational education programs will have as favorable perceptions of these programs as penitentiary staff.

If, as has been suggested earlier, inmates share the high evaluation which the noncriminal attaches to being educated, participation in a group therapy program should make no difference in the criminal's evaluation of the academic education program. The situation should be quite different regarding the impact of group therapy on inmates' perception of the vocational training program. Criminals are likely to have not only poor work skills, but also negative attitudes toward work. If this is true, then participation in group therapy programs should assist prisoners in developing more positive attitudes toward work, and toward vocational training which equips them for work. These assumptions led to the formulation of the remaining hypotheses. They may be stated as follows:

Hypothesis 3: Participants in the group therapy program will have more favorable perceptions of the vocational training programs than nonparticipants.

Hypothesis 4: Participation in group therapy will have no effect on inmates' evaluation of the academic education program.

Hypothesis 5: Participants in the group therapy program will have as favorable perceptions of the vocational training program as staff.

Hypothesis 6: Both participants and nonparticipants in group therapy will have as favorable evaluations of academic education as staff.

C. METHOD

The study was conducted in a medium security Canadian penitentiary. Subjects were 89 members of staff and 175 inmates. This represented 70 percent of the staff and 75 percent of the inmate populations, respectively. Subjects completed a 15 item questionnaire which constituted a Vocational Training Perception Scale and a 10 item Academic Education Perception Scale. These scales were specifically designed to measure perception of the rehabilitative value of the vocational training and academic education programs, respectively.

An item was included in a scale only if both staff and inmates had indicated that it had entered into their evaluation of the utility of the program in question in effecting the rehabilitation of inmates. Items included in the scales were identified by content analysis of interviews of staff and inmates. In addition, so as to ensure the unidimensionality of each scale, all items included in a scale had to meet an interitem consistency criterion of a .20 Kendall correlation coefficient with all other items in the scale.

Subjects were asked to select one of five alternative responses to each item on a scale indicating the strength of their agreement or disagreement with the item. Choices ranged from "strongly agree," through "neither agree or disagree" to "strongly disagree." Responses on each scale were scored 1 through 5, with a high score indicating a perception of a positive association between participation in the program and rehabilitation of inmates. Scores on each scale were normalized according to usual procedures by adjusting for missing observations and dividing by an appropriate factor to obtain scores varying from 0 to 10.

Perforce this study was an after-only design to determine the inmate's perception of the penitentiary programs. This may lead some readers to argue that the obtained differences between the participants and nonparticipants in programs may not have resulted from the programs, but reflect initial differences that played a role in the decision to participate or not to participate. The writers take the view that participation in the programs rather than any prior psychological set was the critical variable. This is supported by other research (6) which indicates that where participation in penitentiary programs is determined by voluntary elections, in circumstances

in which those elected could hardly have anticipated the fact of election with any degree of certainty, participation in the program led to more favorable perceptions of the program involved.

D. RESULTS AND DISCUSSION

A summary of the research findings is presented in Table 1, which indicates that the data supported Hypothesis 1. Participants in both the vocational training and academic education training programs, had significantly more favorable perceptions of these programs than nonparticipants. The writers have shown elsewhere that this result may be predicted by dissonance theory. Participants in these programs may be motivated to feel that they are benefiting or will benefit from taking part in them (5). The data only partially supported Hypothesis 2. Participants in the academic education program had as favorable perceptions of this program as did the staff. However, this was not the case with the vocational education. Participants in this program had significantly less favorable perceptions of this program than did the staff.

The data also supported the hypothesis with respect to the differential effects of participation in group therapy on inmates' evaluation of vocational training and academic education. Table 1 shows that inmates taking part in group therapy had more favorable evaluations of vocational training than did those not enrolled in group therapy. However, participation in group therapy had no effect on inmates' evaluation of the academic education program. Hence, the data supported both Hypothesis 3 and Hypothesis 4.

Table 1 indicates that participation in group therapy is more efficacious than participation in vocational training in improving inmates' evaluation of vocational training. Inmates taking part in group therapy had as favorable perceptions of vocational training as the staff. Participants in the vocational training program, although they had more favorable evaluations of the program than nonparticipants, still had significantly less favorable perceptions of the program than staff. Hypothesis 5 was, therefore, supported by the data.

The data failed to support Hypothesis 6. As predicted in the theoretical framework, participation in group therapy made no difference in the inmate's perceptions of the academic education program. However, this similarity in the perceptions of these groups was associated with a relatively low evaluation of academic education, rather than the high evaluation we predicted. Presumably, inmates generally felt that academic education, when compared with vocational training, contributed relatively little to their effective

TABLE 1
 t TESTS ON SCORES OF INMATES AND STAFF ON VOCATIONAL TRAINING AND ACADEMIC
 EDUCATION PERCEPTION SCALES, INDICATING EFFECT OF PROGRAM PARTICIPATION

EDUCATION PERCEPTION SCALES, INDICATING EFFECT OF PROGRAM PARTICIPATION								
Program	N	Mean	SD	Mean differences				
				PI-NPI		PI-S		NPI-S
<i>Vocational Training Perception Scale</i>								
Vocational training								
Inmate participants (PI)	90	5.540	1.621	— .015 to —0.099*	1.07 to	0.28*	1.57 to	0.93*
Inmate nonparticipants (NPI)	83	4.965	1.136					
Staff (S)	89	6.221	0.990					
Group therapy								
Inmate participants	39	5.945	1.483	—0.36 to —1.36*	—0.72 to	0.16	1.46 to	0.81*
Inmate nonparticipants	133	5.089	1.357					
Staff	89	6.221	0.990					
<i>Academic Perception Scale</i>								
Academic education								
Inmate participants	59	6.042	1.501	—0.08 to —0.99*	0.78 to	—0.03	1.25 to	—0.56*
Inmate nonparticipants	111	5.509	1.391					
Staff	89	6.415	0.996					
Group therapy								
Inmate participants	39	4.486	1.870	0.65 to —0.46	2.18 to	1.18*	2.01 to	1.17*
Inmate nonparticipants	133	4.578	1.699					
Staff	89	6.415	0.996					
* Significant at .05 level.								

* Significant at .05 level.

rehabilitation. Of course, it is important to realize in this regard that rehabilitation may mean different things to inmates and staff (6).

E. CONCLUSION

This study illustrates some limitations on the use of group therapy as a technique for attaining the resocialization of criminals. Group therapy assisted in developing more positive attitudes among inmates as far as vocational training is concerned, but had no effect on the negative attitudes of inmates towards academic education. Actual participation in a program, through the operation of pressures to reduce cognitive dissonance created by such participation, seems to have been more efficacious in creating positive evaluations in the case of academic education than in the case of vocational training.

REFERENCES

1. CRESSEY, D. R. Contradictory directives in complex organizations: The case of the prison. *Admin. Sci. Quart.*, 1968, 4, 1-19.
2. GALTUNG, J. The social functions of a prison. *Soc. Prob.*, 1958, 6, 127-140.
3. GIBBONS, D. C. Some notes on treatment theory in corrections. *Soc. Sci. Rev.*, 1962, 36, 295-305.
4. OHLIN, L. E. The reduction of role conflict in institutional staff. *Children*, 1958, 5, 65-69.
5. SHIHADDEH, E. S., & NEDD, A. N. B. Inmate evaluation of a penitentiary incentive program. *Can. J. Crim. & Corrections*, 1973, 15, 229-238.
6. ———. The perception of penitentiary inmates and staff. *J. Soc. Psychol.*, 1974 99, 217-224.

Faculty of Business Administration and Commerce
University of Alberta
Edmonton, Canada T6G 2C1

COMMUNICATIVE PATTERNS OF SELF-DISCLOSURE AND TOUCHING BEHAVIOR*¹

Tel-Aviv University, Israel

J. LOMRANZ² AND A. SHAPIRA

SUMMARY

One hundred ninety, male and female Israeli high school students responded to questionnaires inquiring into self-disclosure and touching behavior toward four target persons: father, mother, same-sex friend, and opposite-sex friend. The results confirmed the hypothesis that the two patterns were significantly positively correlated, indicating a consistent structural context expressed through interpersonal interaction. The results also found that the males engaged in significantly more touching behavior than the females, while for self-disclosure the trend was reversed. The implications of these and other findings are discussed in terms of sub- and cross-cultural norms in personality research.

A. INTRODUCTION

Self-disclosure refers to the process of making the self known to other persons. It has been found that self-disclosure is a function of the relationship to the target person in the context of the subject's sex, religion, ethnic group, and marital status (5). Disclosure of one's emotions, feelings, and personality is also realized in touching behavior, which is an initial form of communication. By feeling and exploring his own body, the baby begins to communicate with himself and learns to distinguish between "me" and "not me" (3). In adults the highest rate of tactual interchange was found to occur between closest friends of the opposite sex (6). Self-disclosure and touching behavior may both be characteristic personality dimensions of interpersonal communication, since both indicate movement towards, or away from, significant others. Both, under certain conditions, signify emo-

* Received in the Editorial Office on August 5, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The authors wish to thank Ela Joeli and Esther Alpert for their contributions to this study.

² Reprint requests should be addressed to the first author at the address shown at the end of this article.

tional components of reaching out and sharing, openness and flexibility, as opposed to withdrawal, restraint, and rigidity. Yet Jourard and Rubin (8) were unable to demonstrate a correlation between the two modes of self-disclosure and touching. In their study, conducted in the South (USA), the authors emphasized the importance of cultural factors and implied that the generality of their findings may therefore be limited. Moreover, recent studies (4, 9 10) have revealed significant cross-cultural differences in the use of personal space. The cultural factor is particularly evident in Hall's (4) notion of contact and noncontact, where people in the noncontact cultures (including the USA) maintain greater physical and interpersonal distances, and touching behavior is correspondingly rare. The opposite holds for contact cultures. One should reasonably expect, therefore, that a person who tends to be highly self-disclosing will also display a high degree of touching behavior, given a culture supportive of touching behaviors. Since sex differences have been shown to be important in both self-disclosure and touching behavior, and since the two dimensions are usually expressed through interaction with significant others, the design of our study attempted to isolate possible sex differences, as well as to allow the evaluation of interactions with different target persons.

B. METHOD

1. *Subjects*

Subjects were 95 male and 95 female Israeli students, aged from 17 to 19. They were drawn from three Tel-Aviv high schools representing the average middle class.

2. *Instruments and Procedure*

Two standard questionnaires on both self-disclosure and touching behavior, respectively, were administered to Ss as a group in school classrooms. A rest period was given following the completion of each questionnaire. A brief description of these instruments follows. In Jourard and Lasakow's (7) questionnaire on self-disclosure, items are classified in groups of 10 within each of six more general categories of information about the self. The categories pertain to the following areas: Attitudes and Opinions, Tastes and Interests, Work or Studies, Money, Personality, and Body. The subject is instructed to indicate on a four-point scale the extent to which he had talked about each item to each of four target persons: mother, father, friend of same sex, friend of opposite sex. The S's self-disclosure score is based on the intensity and number of self-disclosing responses pooled over all six

categories and over all targets. A high score indicates a high degree of self-disclosure.

Information about tactile contact was derived from Jourard's Body Accessibility Questionnaire (6). The questionnaire has a front and back sketch of a person divided into eight body regions. The subject is asked to indicate the body region that he touches and is touched by each of the four target people, and to judge the intensity of this behavior by using a four-point scale which ranges from "no touching" to "much touching." The touching behavior score is the number of body regions S indicates as touching or being touched by each of the four target persons, multiplied by the respective intensities. A high score indicates high physical contact.

C. RESULTS

A significant positive correlation between the two measures was found ($r = .46$, $n = 190$, $p < .01$), indicating that people who are high in self-disclosure are also high in touching behavior. This significant relationship was even more pronounced when separate analyses were performed for men ($r = .65$, $n = 95$, $p < .01$) and women ($r = .63$, $n = 95$, $p < .01$). Separate analyses of the four target people showed that the relationship between self-disclosure and touching was slightly stronger for friends of either the same sex ($r = .47$) or opposite sex ($r = .46$), than for father ($r = .39$) or mother ($r = .34$).

Detailed analyses were also conducted on the mean scores of "self-disclosure" and "touching behavior," respectively, for males and females for the separate target people. An analysis of variance (2×4 design with repeated measures on one factor) for self-disclosure and touching behavior indicated that women were more self-disclosing ($\bar{X} = 50.3$) than men ($\bar{X} = 45.8$), although this difference only approached significance ($F = 3.44$, $df = 1/184$, $p < .10$). However, with regard to touching behavior, the opposite was found: that is, men reported a significantly greater extent of touching behavior ($\bar{X} = 57.8$) than did women ($\bar{X} = 54.8$) ($F = 6.69$, $df = 1/184$, $p < .05$).

On self-disclosure, differences in target were not significant. The analyses of the eight subgroup means show the highest degree of self-disclosure given to a friend of the same sex ($\bar{X} = 59.0$), and the lowest given to father ($\bar{X} = 39.4$). Subjects also reported significantly more touching with a friend of the opposite sex than with any of the other target people ($F = 60.3$, $df = 3/552$, $p < .01$). A significant interaction between sex and target people ($F = 6.93$, $df = 3/552$, $p < .01$) showed that the discrepancy between

touching a friend of the opposite sex and the other target people was greater for males than for females.

D. DISCUSSION

The results clearly showed a highly significant and positive relationship between self-disclosure and touching behavior, and thus confirmed the central hypothesis. The correlation between the two dimensions of communication suggests some common underlying processes. It would seem tenable that certain people are, conjointly, high or low in self-disclosure *and* touching behavior. If body movements are learned forms of nonverbal communication patterns in a given culture, as Birdwhistell maintains (2), then one should predict some corresponding correlation with the more verbal dimension of self-disclosure. Together, the two dimensions appear to constitute a meaningful structural context through which human beings interact in consistent regularity modulated by the cultural climate, of which sex is a major component.

Inspection of the results reveals notable sex differences. We found that in general men engage in significantly more touching behavior than women, while in self-disclosure the trend is reversed. That women are more self-disclosing is supported by other findings (7, 8), and may reflect a socializing process and cultural norm which limits the use of touching behavior for women as a communicative mode and basically restricts them to the verbal dimension. Men, however, tend to express themselves or act out on the physical level as well. We wish to emphasize that Jourard and Rubin (8) received a different finding (i.e., that women engage in significantly more touching behavior than men). We tend to explain this on the basis of different norms for males in the cultures from which the two samples were drawn. While there is no overall difference between the two studies in the touching behavior of females, in our study males have significantly greater body accessibility than their U.S. counterparts. The Middle Eastern cultures seem to be more permissive about touching behavior as it pertains to males. Hence, it seems that compared to the American sample the different findings result not from women touching less in our study, but from men touching more.

We were also interested in inquiring into the relationship between sex and target persons. Males and females are most self-disclosing towards same-sex friends and least disclosing towards their fathers. Regarding touching behavior, however, all subjects have most physical contact with their opposite-sex friends. The results indicate that the discrepancy between touching a friend of the opposite sex as opposed to all other target persons is greater for males than for females. As regards self-disclosure, however, the tendency is

for females to be less consistent, while the opposite trend is reflected by males. These differences suggest that on the dimension in which each sex is "strong" (i.e., women in self-disclosure and men in touching behavior) allows the respective *S* to enjoy more elaboration and differentiation toward the various communicative objects. We wish, however, to emphasize that despite the differences between sexes and within sexes towards the various target persons, a highly significant and consistent correlation between the two dimensions is, after all, maintained in each. This strengthens and supports our basic hypothesis regarding the existing relationship between self-disclosure and touching behavior.

Investigating the intricacies of social interaction bears implication also for the conceptualization of personality. The interrelationship of the two investigated dimensions indicates a style of behavior integrated in a personality configuration. Together with Allport (1), we consider investigation of the mutual interdependence of part-systems as a major avenue in comprehending the total personality system. It is precisely that interdependence in which we are interested, and therefore see the importance of our study in clarifying the relationship between the two communication processes as it is differentially revealed by the particular features of the subject.

REFERENCES

1. ALLPORT, G. W. *Pattern and Growth in Personality*. New York: Holt, Rinehart & Winston, 1961.
2. BIRDWHISTELL, R. L. *Kinesics and Context*. London: Penguin, 1971.
3. FRANK, L. K. Tactile communication, etc. *Rev. Gen. Semantics*, 1958, **16**, 31-79.
4. HALL, E. T. *The Hidden Dimension*. Garden City, N. Y.: Doubleday, 1966.
5. JOURARD, S. M. *The Transparent Self*. New York: Van Nostrand, 1964.
6. ———. An exploratory study of body-accessibility. *Brit. J. Soc. & Clin. Psychol.*, 1966, **5**, 221-231.
7. JOURARD, S. M., & LASAKOW, P. A research approach to self-disclosure. *J. Abn. & Soc. Psychol.*, 1958, **56**, 91-98.
8. JOURARD, S. M., & RUBIN, J. E. Self-disclosure and touching: A study of two modes of interpersonal encounter and their inter-relation. *J. Hum. Psychol.*, 1968, **8**, 39-48.
9. LITTLE, K. B. Cultural variations in social schemata. *J. Personal. & Soc. Psychol.*, 1968, **10**, 1-7.
10. WATSON, O. M., & GRAVES, T. D. Quantitative research in proxemic behavior. *Amer. Anthropol.*, 1966, **68**, 971-985.

*Neuropsychological Unit for
Research and Rehabilitation
Department of Psychology
Tel-Aviv University
Tel-Aviv, Israel*

SEX DIFFERENCES IN PREFERENCES FOR SEX OF CHILDREN: A REPLICATION AFTER 20 YEARS*

Department of Psychology, University of New Mexico

RALPH D. NORMAN

SUMMARY

The present study replicated 1954 research showing marked boy child preference and attempted to evaluate changes because of the women's and the population movements. Ss were 412 college students, 315 nonparents and 97 parents. The questionnaire duplicated an earlier one on sex preferences for first and only children for nonparents, and added two- and three-child preferences. The parent questions assessed family sex balance; satisfaction-dissatisfaction with offspring sex; and wanting-not wanting more children. The nonparent results show significant ($p < .02$) two-decade intrasex preference shift from boys to equalitarianism for first child, with little girl increase. The only-child data still show majority preference for boys among both sexes. An overwhelming preference existed for two-child sex balance, but three-child predominantly boy families. Among parents, significant ($p < .01$) association occurred between satisfaction and balance. Further analysis revealed desires for more boys. The conclusion is that pressures for sons are mitigated little by the women's movement and may work as a population growth force.

A. INTRODUCTION

Twenty years ago, Dinitz, Dynes and Clarke (5) reported marked preference for male offspring over female among college students. However, since that time, two social forces have arisen to raise questions concerning the current validity of their findings. One is the Women's Liberation Movement and the other is concerned with population increase, manifested in such groups as Zero Population Growth (ZPG). It might be expected that the former should cause reduction of preference for boys, while the latter should operate towards greater satisfaction with children regardless of sex. Both

* Received in the Editorial Office on August 8, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

forces should therefore ease pressures toward trying for a male child. Such pressures have been recently discussed by Etzioni (6), Markle (8), and Westoff and Rindfuss (16). Etzioni, looking at the broad societal picture, views such pressures with dismay, especially since sex selection before conception may be in the offing as a scientific breakthrough. Westoff and Rindfuss are more sanguine, reporting that current attitudes of married women suggest that a substantial percentage would not be favorably disposed toward sex preselection. The present study is an attempt to assess the relative social impact of these two forces, partially by replicating the 1954 study and partially by looking at additional new data among college subjects.

B. METHOD

The Dinitz *et al.* (5) study used a questionnaire administered to 380 Ohio State University students about equally divided as to sex. The present investigation, aside from exploring other problems, utilized the same or similar questions given to 315 University of New Mexico undergraduates in 1973. The two studies, however, are not completely comparable. Aside from obvious differences in time and place, the 1954 study did not separate students who were parents from those who were not. Both Pohlman (11) and Westoff and Rindfuss (16) state that present parenthood influences preferences for sex of children. Pohlman reports that parents of a child or children of a given sex generally rechoose offspring of the same sex they already have. Markle (8) found somewhat different results using respondents with a minimum of one child who expected no additional children. However, Markle's data give sex preference for a first child in "desired" families, contrasting these results with sex of the first child ever born, a different methodological approach to "rechoosing." Westoff and Rindfuss (16) demonstrate clearly that sex composition of present children affects choice of sex of next child of married women.

In the present study, it was found that 97, or 23.5%, of 412 students were parents of one or more children. This relatively high percentage probably did not hold 20 years ago. Sullerot (14), for example, points out that women, particularly in developed countries, have married younger and borne children increasingly in their early youth over the past few decades. This trend is even stronger in the United States where, she demonstrates, more than half of all women now have their last child before age 30. Accordingly, in order to make a more likely contrast, it was decided in the present study to compare the 1954 study with data gathered from students who were nonparents, whether single or married. Student parents were asked a different set of

questions. These involved sex distribution of their present children, their rechoice of the sex of these children if somehow they could have a rechoice, their preference for another child, and what they would like the sex of that child to be.

The 1954 study used subjects enrolled exclusively in sociology courses, whereas in the present study they were drawn from a wide variety of fields. The respective numbers in various courses of men and women were as follows: anthropology, 21 and 22; economics, 10 and 14; engineering, 15 and 0; mathematics, 36 and 14; nursing 0 and 17; psychology, 53 and 52; and sociology, 20 and 41. There was a total of 155 men and 160 women with no statistically significant difference in their mean ages.

The earlier study assessed preferences for a child of either sex in two ways. One requested preference for sex of the first child, with responses being boy, girl, or either. A second question tested sex preference more directly by removing the equalitarian choice and offering the respondent choice of one child only. The present study repeated these exactly but added questions based on sensitivity to the population problem: i.e., preferences given only two or at most three children.

C. RESULTS

Table 1 presents comparisons between the two studies for the first two questions. Chi square tests show that there has been a statistically significant intrasex shift in sex preference of a first child over the 20-year period (men, $\chi^2 = 7.86$, $df = 2$, $p < .02$; women, $\chi^2 = 8.52$, $df = 2$, $p < .02$). Among both men and women students, about 15% fewer specified a boy as preferred in 1973 than in 1954. However, the shift was not towards having the first child a girl, for such a change was practically inconsequential (.8%) among men, and even among women showed only a 5.1% gain. The shift occurred predominantly from choice of a boy to that of "either." The latter category rose 14.2% among men, 9.8% among women. Differences between the sexes were statistically insignificant in both years (1954, $\chi^2 = .92$, $df = 2$; 1973, $\chi^2 = 3.86$, $df = 2$).

Table 1 also reveals results when preferences were limited to one child only. Preference for a boy in 1973, while showing slippage from 1954, was still large. Chi-square tests, corrected for discontinuity, show that the intersex differences were statistically significant in both years (1954, $\chi^2 = 34.14$, $df = 2$, $p < .001$; 1973, $\chi^2 = 26.54$, $df = 2$, $p < .001$), whereas intrasex differences were not (men, $\chi^2 = 2.01$, $df = 1$; women, $\chi^2 = 1.81$, $df = 1$). Among men preference for an only boy was 5.8% less; among women prefer-

TABLE 1
SEX DIFFERENCES IN SEX PREFERENCE OF FIRST OR ONLY CHILD
AMONG UNIVERSITY STUDENTS OVER TWO DECADES

Sex of student	Boy		Preferred sex of child		Either	
	N	%	N	%	N	%
<i>First child</i>						
Male						
1954 (<i>N</i> = 185)	115	62.1	8	4.4	62	33.5
1973 (<i>N</i> = 155) ^a	73	47.1	8	5.2	74	47.7
Female						
1954 (<i>N</i> = 195)	114	58.6	12	6.2	69	35.2
1973 (<i>N</i> = 160) ^a	79	43.8	18	11.3	72	45.0
<i>Only child</i>						
Male						
1954 (<i>N</i> = 185)	169	91.5	16	8.5		
1973 (<i>N</i> = 148) ^a	127	85.8	21	14.2		
Female						
1954 (<i>N</i> = 195)	129	66.1	66	33.9		
1973 (<i>N</i> = 157) ^a	92	58.6	65	41.4		

^a Slight variations in 1973 *N*s were caused by omissions of answers by a few subjects.

ence for an only girl was 7.5% more, but the majority preference in both sexes was still for a boy.

In exploring their research further, Dinitz *et al.* (5) report that when desired sex composition of future families was determined, over 55% of their subjects preferred an equal number of boys and girls, more than 38% desired all or predominantly boys, and only about 6.5% wanted all or predominantly girls. It was judged not feasible in the present study to make exact comparisons with these figures, partially because the authors gave no percentage breakdown according to respondent sex, but principally because of effects of the population movement. For example, a recent sharp drop in birth expectations of young wives ages 18 to 24 forced census authorities to revise population predictions under a new set of assumptions of completed cohort fertility (15). Whereas formerly they had used Projection Series B at 3.1, Series C at 2.8, Series D at 2.5, and Series E at 2.1 births per family, they were forced to drop Series B as "unrealistically high" and introduce a new Series F at 1.8, an unprecedented low, although Blake (2) cautions conservatism about recent census data because she believes they may have been influenced by massive antinatalist propaganda. The ZPG proponents have used the two-child family (essentially Series E) as their "replacement" formula (2). Therefore, students in this study were asked what preferences

they would have for only two children. Also, in order to arrive at an approximation of the "all" or "predominantly" concepts of the 1954 study, and to follow Series C and D projections, they were asked what their preferences would be on the supposition they had three. Table 2 presents the data for these two questions.

Table 2 shows that an overwhelming majority, or more than 90 percent of both men and women, chose a boy-girl balance rather than two children of the same sex when given a two-child preference. (Percentages other than in Table 2 were: two boys, men = 9.2, women = 5.7; two girls, men = .7, women = 2.5. Same-sex raw *N*s were combined to increase table cell size for the χ^2 test.) Sex differences between men and women in this case were statistically insignificant ($\chi^2 = .08$, $df = 1$). However, as was shown in Table 1, when the equalitarian choice was removed, preferences immediately shifted to boys, despite the fact that there was a statistically significant overall difference between the sexes ($\chi^2 = 6.67$, $df = 1$, $p < .01$). More than three men in four (78.3%) and almost two women in three (64.3%) preferred an all-boy or predominantly boy family. (Basic percentages were as follows: three boys, men = 2.0, women = 3.8; two boys, one girl, men = 76.3, women = 69.5; two girls, one boy, men = 21.0, women = 33.1; three girls, men = .6, women = 2.5. Again, raw *N*s were combined to increase cell sizes.) Generally, then, results from the two questions collectively in 1973 were probably not too dissimilar from what was probably a single question of the 1954 study, especially since it should be considered that the latter was performed close to the peak birth rate in the mid-fifties. Our data corroborate the statement by Pohlman (11) that U.S. families have two kinds of preferences for sex of children. These are for at least one child of each sex or for boys. Westoff and Rindfuss (16) also confirm very strongly the drive for sex balance after first-child boy preference.

Attention is now drawn to preferences among student parents, composed

TABLE 2
SEX DIFFERENCES IN SEX PREFERENCE FOR TWO OR THREE CHILDREN

Sex of student	Preferred sex of child							
	Two-child family				Three-child family			
	Same sex		Boy & girl		Predominantly boys		Predominantly girls	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Male	15	9.8	138	90.2	119	78.3	33	21.7
Female	13	8.2	145	91.8	101	64.3	56	35.7

Note: Male *N*s, two-child family = 153; three-child family = 152. Female *N*s, two-child family = 158; three-child family = 157.

of 59 men and 38 women. These could be further subdivided, according to replies to questions described earlier, into those who had balanced or unbalanced families. This group could again be broken down into those who were either satisfied or dissatisfied with sex composition of present children. Finally, the latter could be separated into those who either wanted or did not want more offspring. Before discussing preferences in this parental group, we should mention that there was a statistically significant difference in the mean ages of men and women. The women's mean age was 31.4 years, the men's was 27.8 years ($t = 2.30$, $.02 > p < .05$). This is understandable, if it is assumed that many married women, as mentioned earlier, have had their last child before 30, and are attempting to complete an education interrupted by responsibilities for young children. The significant age difference undoubtedly accounts for the statistically significant sex difference in desires for another child. Less than one quarter (23.7%) of the women as compared to more than half (52.5%) of the men wanted another child ($\chi^2 = 6.80$, $df = 1$, $p < .01$). Also, while the difference in proportions between men and women having balanced vs. unbalanced families was not significant ($\chi^2 = 1.21$, $df = 1$), the percentage of women with balanced families (26.3%) was higher than that among men (15.3%). This too may have been because they were older and thus proportionately more had achieved balance. Differences between percentages of men (25.4) and women (26.3) expressing dissatisfaction with offspring sex was statistically insignificant ($\chi^2 = .02$, $df = 1$).

The most striking finding in the parent group was that the balanced family condition was statistically significantly associated with satisfaction with sex composition of present children ($\chi^2 = 8.20$, $df = 1$, $p < .01$). Nobody in the balanced family group expressed any dissatisfaction, although a balanced family did not completely eliminate desire for another child. Yet pressures were still evident, expressed principally in the unbalanced groups. These pressures could exist in two ways. In one, it was through wanting another child, whether or not one was satisfied with family sex composition. In the other, it was shown in dissatisfaction with such composition although no desire for another child was expressed. In analyzing the situation where another child was wanted, we found that what was shown in Tables 1 and 2 about preferences for boys among nonparents held true among parents also. For 31 fathers, only three of whom had balanced families, the totals of present children were 15 boys and 27 girls. The sexes of wanted children were 25 boys and six girls. Looking at present sex composition of their families, we speculated that 19 boys were wanted for balance and sex in excess of it. Comparable girls figures were five and one. If sex preselection were a

reality and wants were exactly fulfilled, boy-girl ratios in these men's families would be 40:33, or 1.2 to one. Their children, both present and desired, would constitute 2.4 per family, considerably more than a 2.1 "replacement level" and close to the now second highest census Series D of 2.5. The latter fertility rate projects to at least 21.5 million more people by the year 2000 than one of 2.1 (15).

It is possible that some sampling error caused sons to be deficient in this group compared to daughters. However, looking at data among fathers with unbalanced families who did *not* want more children ($N = 22$), we found 58.3% of the 12 satisfied men of this subgroup had an unbalanced boy majority, whereas 70% of the 10 dissatisfied men had an unbalanced girl majority. There is some rough evidence here that "nonwanting" satisfied men, at least, had achieved their boy quota and would otherwise have appeared among "wanting" men.

Statements about mothers ($N = 9$) who wanted more children are much more precarious. However, these women, only two of whom had a balanced family, had a present total of eight sons and eight daughters. Apparently, they too expressed need for balance, but were also desirous of more boys (six sons, three daughters). If they had wants for a next child exactly fulfilled, boy-girl ratios would be 14:11, or about 1.3 to one. Their 25 children, both extant and desired, would constitute 2.8 per family, the highest (Series C) census projection level. Of the 40 men and women together, there was a desired boy-girl ratio of 3.4 to one. The total of 98 children, both present and desired, would have a ratio of 1.2 to one. If all these individuals adhered to their wishes and used possible sex control successfully, the children per family would soar theoretically to about 2.45, the actual U.S. Census figure for Series D before rounding (15), and there would be an excess of male births. To summarize succinctly the whole impact of results from parents wanting more children, it may be said that pressures for boys were still highly visible in 1973 and probably constitute an antipopulation control force.

The other source of pressure lies among those showing dissatisfaction with sex composition of present children although not expressing desires for another child. This group constituted 10 men and eight women. The 10 men as a group had 11 sons and 11 daughters but would have preferred to have had 12 sons and eight daughters. The eight women had a total of 11 sons and 19 daughters but would have preferred to have had 14 sons and 16 daughters. (Seven of the 10 men and six of the eight women had an unbalanced girl majority.) Overall, among these 18 individuals, the desire for balance again appeared to be present, but coupled with the strong preference for boys,

yielded a net gain of four sons and net loss of six daughters. Such an "exchange" would have probably rendered them more satisfied.

D. DISCUSSION

Data presented in this study are in agreement with those of Markle (8), who showed that all standard demographic subgroups have strong preferences that their first child be a boy and prefer a completed family with an excess of boys. Although we did not achieve, with out childless group, as high boy to girl sex ratios as he did, it should be considered that there were substantial differences in subjects and methodology between the two studies.

The 15 percent significant drop in preference for boys over the 20-year span, as shown in Table 1 first-child data, may have been due to the effects of greater respect for women induced by social forces released by the women's movement. But while this hypothesis cannot be gainsaid, the fact that the shift was not markedly towards having the first child a girl, but rather in the equalitarian direction, may raise questions about the strength of that movement at this point. This is said especially since increase in preference (5.1%) for a girl was so small among women themselves. It is more likely that pressures toward population control may have been more effective as an impetus for change. Such pressures would involve forces affecting society as a whole (e.g., inflation, environmental concerns, overcrowding, etc.) more intimately and strongly than the women's movement.

Perhaps the validity of the above argument may be reinforced by examining Table 1 only-child data, where the undercurrent of boy preference emerges so sharply with equalitarianism removed. True, preferences for girls have risen over two decades, but again not much more among women (7.5%) than among men (5.7%). These impressions are simply strengthened by Table 2 data, involving sex preferences with two and three children.

There is little surprise in the fact that men so highly preferred boys, a thread running strongly through our results. But many more women at zero parity chose boys rather than girls either as first or only children (Table 1), and predominant members of three-child families (Table 2). These data are in agreement with those of Westoff and Rindfuss (16) who studied a national probability sample of 6000 married women under 45. Even the relatively tiny number of our married women wanting more children desired more boys than girls. This is certainly a reflection on the more negative evaluation these intelligent and educated women had of their own sex in not desiring to reproduce themselves and appears to confirm our hypothesis about minimal effects of the women's movement. This devaluation is not a myth, as shown

in recent research by Lunneborg (7) and Broverman *et al.* (3). Lunneborg found that existing sex differences as measured by the Edwards Personality Inventory were much exaggerated by college subjects asked to respond to the test as a typical male or female would. Both sexes depreciated females. Broverman *et al.*, using subjects of both sexes over a wide educational and age range, found of 41 bipolar (masculine-feminine) sex-stereotyped items, 71% at the masculine pole were selected as more desirable. These studies confirm earlier ones demonstrating that both sexes thought more highly of males and more poorly of females (1, 9, 10, 12, 13).

Our data clearly identify 40 of 97 (41.2%) of parents desiring another child. While 28 of these had only children, and many were postulated as seeking balanced families, the predominant pressures were for boys. These pressures can work as a population-control counterforce. Thus, if antinatalism continued to be highly successful, so that children per family moved closer to the low census Series F figure of 1.8, and if sex preselection became a reality, it is still likely that there would be greater demands for boys. Etzioni (6) speaks of the "one more try" for a boy in unbalanced girl families, citing research showing that significantly more families stopped having children after they had a boy than after they had a girl. More recently, Dawes (4) studied a sample of completed families from the 1960 census, finding better acceptance of all-boy than all-girl families, corroborating Etzioni's contention. In the recent Westoff and Rindfuss (16) data, boys are again more preferred as firstborns. The authors also calculate that if sex preselection were available, and even though balance would be sought primarily, a two-boy family would be expected 128 times in a sample of 1000 women, but a two-girl family only 82 times in a 1000. Of the eight possible sex orders in a three-child family, a predominantly boy family would be expected 539 times per 1000 but a predominantly girl family 462 times per 1000.

There is apparently room for debate concerning broad social effects of more male births with sex control. Etzioni (6), for one, is concerned about growth of crime and aggression; increased male celibacy and homosexuality; higher rate of prostitution; and even increased class tensions because more boys from lower socioeconomic groups would seek girls from higher status groups. Markle (8), on the other hand, while acknowledging that sex pre-determination would vary with different demographic subgroups, maintains that a large percentage of the population would not use sex control techniques. Westoff and Rindfuss (16) agree, on the basis of a poll of their married women. If preselection were used, they predict a wave of male births, followed by one of females to achieve balance. Of interest to the women's

movement is the fact that they also note that since sociopsychological literature suggests that firstborns are more susceptible to social pressure and more likely to be educational and economic achievers than subsequent children, achievement orientation would be thus concentrated first among males. It is important to our findings which show great male preference for sons to note that they caution that the influence of the husband in increasing the proportion of male births should not be discounted, admitting their projections are based exclusively upon female opinions. It is interesting that they say, "Indeed, if fertility continues to decline in the United States and the one-child family becomes more common, an increase in the proportion of male births would then . . . be expected here" (16, p. 636). Markle (8) also offers a theoretical model from his population sample showing that uncorrected increased higher ratios of males to females would lengthen population doubling time.

We agree with other authors (6, 8, 16) that sex-role ideologies should be introduced into fertility research and used along with other sociopsychological variables in study of demographic behavior. Data from the present study indicate that most probably sex-role perceptions, at least as reflected in preferences for male children over female, have not changed radically over the past two decades. Future replications of this study are certainly in order as one means of assessing such perceptions.

REFERENCES

1. BENNETT, E. M., & COHEN, L. R. Men and women: Personality patterns and contrasts. *Genet. Psychol. Monog.*, 1959, **59**, 101-155.
2. BLAKE, J. Can we believe recent data on birth expectations in the United States? *Demography*, 1974, **11**, 25-44.
3. BROVERMAN, I. K., VOGEL, S. R., BROVERMAN, D. M., CLARKSON, F. E., & ROSENKRANTZ, P. S. Sex-role stereotypes: A current appraisal. *J. Soc. Iss.*, 1972, **28**, 59-78.
4. DAWES, R. M. Sexual heterogeneity of children as a determinant of American family size. *Oregon Res. Publ.*, 1970, **10**, No. 8.
5. DINITZ, S., DYNES, R. R., & CLARKE, A. C. Preferences for male or female children: Traditional or affectional? *Mar. & Fam. Living*, 1954, **16**, 128-130.
6. ETZIONI, A. Sex control, science, and society. *Science*, 1968, **169**, 1107-1112.
7. LUNNEBORG, P. Stereotypic aspects in masculinity-femininity measurement. *J. Consult. & Clin. Psychol.*, 1970, **34**, 113-118.
8. MARKLE, G. E. Sex ratio at birth: Values, variance, and some determinants. *Demography*, 1974, **11**, 131-142.
9. MCKEE, J. P., & SHERRIFFS, A. C. The differential evaluation of males and females. *J. Personal.*, 1957, **25**, 356-371.
10. ———. Men's and women's beliefs, ideals, and self-concepts. *Amer. J. Sociol.*, 1959, **64**, 356-363.
11. POHLMAN, E. *The Psychology of Birth Planning*. Cambridge, Mass.: Schenkman, 1969.

12. SHERRIFFS, A. C., & JARRETT, R. F. Sex differences in attitudes about sex differences. *J. of Psychol.*, 1953, **35**, 161-168.
13. SHERRIFFS, A. C., & MCKEE, J. P. Qualitative aspects of beliefs about men and women. *J. Personal.*, 1957, **25**, 451-464.
14. SULLEROT, E. Woman, Society, and Change. New York: World Univ. Library, 1971.
15. U. S. BUREAU OF THE CENSUS. Projection of the Population of the United States by Age and Sex: 1972 to 2020. Current Population Report, Series P-25, No. 493. Washington, D. C.: U. S. Gov't. Printing Office, Dec. 1972.
16. WESTOFF, C. F., & RINDFUSS, R. R. Sex preselection in the United States: Some implications. *Science*, 1974, **184**, 633-636.

Department of Psychology
The University of New Mexico
Albuquerque, New Mexico 87131

DEVELOPMENT OF A CURRENT SCALE TO MEASURE CONSERVATISM-LIBERALISM*

Department of Psychology, Texas A & M University

HANNA LEVENSON AND JIM MILLER

SUMMARY

Behaviorally identified student activists involved in conservative causes ($N = 24$) obtained significantly ($p < .001$) higher (more conservative) scores ($M = 110$) on an updated measure of conservatism-liberalism than activists ($N = 24$) for liberal causes ($M = 55$). Other results are reported which indicate that these conservatism-liberalism items show promise for reliably and meaningfully measuring a general ideological dimension.

A. INTRODUCTION

The liberalism-conservatism dimension has been of interest to social psychologists and personality researchers as an important factor in understanding such heterogeneous variables as activism, responses to humor, attitudes toward human nature, and education. However, scales to measure one's ideological proclivity have a number of limitations. Robinson, Rusk, and Head (6) in their review of 17 liberalism-conservatism measures considered only five of the 17 suitable for extensive use. "The problems of datedness, overly sophisticated wording, and inadequate meeting of psychometric criteria have made the remaining scales far less generally useful" [6, p. 81]. Of the five *best* scales, Robinson *et al.* point out that for two there is no information concerning reliability, and for two little evidence of validity, and that one contains overly complicated and dated items.

B. METHOD

Since it was clear that a new ideology measure was needed, the development of a revised conservatism-liberalism scale was undertaken for use in a study of locus of control and activism (5). To develop a new scale, a pilot study was conducted to ascertain which of 55 items would discriminate be-

* Received in the Editorial Office on August 9, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

tween self-reported liberals and conservatives. Fifteen of these items were taken from those mentioned in a study on the measurement of radicalism-conservatism (2). Comrey and Newmeyer had applied a factor analysis of homogeneous item dimensions containing a total of 120 items and found that the second-order factor seemed to represent a radicalism-conservatism attitude continuum. The usefulness of these items in differentiating between those of the political right and left with a new sample remained to be demonstrated.

In addition to these 15 items, 40 other items were written in order to include reference to major events which have occurred in the past few years (e.g., National Guard action at Kent State University, Lt. Calley's trial, the Watergate affair). The selection of the 55 items was based on the degree to which they pertained to a *general* liberalism-conservatism dimension and not just to a political orientation.

Students ($N = 148$) in two introductory psychology classes at a large, state university responded to the 55 items on a six-point Likert format from 1 (strongly disagree) to 7 (strongly agree). These students had previously identified their own political ideology as either conservative or liberal. The internal consistency (coefficient alpha) was .72 for the 15 Comrey and Newmeyer items, .87 for the 40 new items, and .90 for the total 55 items. These high reliabilities indicate that the items have a great deal in common and suggest unidimensionality.

On the basis of the self-report, two groups of liberals and conservatives were selected, and the data were split in half for cross-validated purposes (4). Items which significantly ($p < .05$) discriminated between subjects of different political ideologies on *both* samples were included in the final scale. McNemar points out that this cross-validated procedure should help eliminate any chance differentiation between groups.

The final Con-Lib scale contains 10 Comrey and Newmeyer items and 15 new items.¹ For 13 of these items, agreement indicates a conservative position, while agreement with the remaining 12 items indicates a liberal position (reverse scoring). A high score denotes support of traditional moral values, censorship, strict adherence to laws and authority, disapproval of drug use and abortion, patriotism, religiosity, and military power (range on the final scale = 25 to 175).

¹ For a copy of these items order NAPS Document No. 02448 from Microfiche Publications, 305 East 46 Street, New York, New York 10017; remit \$1.50 for microfiche or \$5.00 for photocopy; make checks payable to Microfiche Publications. Outside the U.S. or Canada, postage is \$2.00 for a photocopy or \$0.50 for a fiche.

The Con-Lib scale was administered to 98 male undergraduate students who were attending one of four large state universities in the Southwest. As part of a larger study the subjects also completed an activism scale to measure their degree of social-political involvement (3). Of these 98 subjects, 48 were identified by knowledgeable people as being extremely active in either politically conservative or liberal causes. Liberal activists were involved in a wide spectrum of issues and activities such as radical journalism, political campaigns both on and off the campus, organizing grass-roots support on issues to be presented to elected officials, lobbying for consumer protection, and seeking more student control over university policy. Conservative activists were involved in student government, in presenting conservative views to the Board of Regents, and in publishing an underground newspaper with the aim of delivering conservative views on news and issues to the student body.

C. RESULTS

Two validation analyses were conducted. In the first, a comparison was made between the Con-Lib scale scores of the behaviorally identified conservative and liberal activists. As predicted, the mean difference was large and highly significant ($F = 83.74, p < .001$). Those who were known to be active in conservative causes had twice the mean score ($M = 110$) on the Con-Lib scale of those who were active in liberal pursuits ($M = 55$). In the second comparison, all subjects were used. The internal consistency (coefficient alpha) for the 25-item Con-Lib scale was .92. There was a significant correlation between political ideology and self-reported levels of activism ($r = -.33, p < .001$). As subjects scored in a more liberal direction, they indicated more involvement in social-political activities. This finding is consistent with past research. Kerpelman (3), in developing his activism scale, found that liberals reported significantly greater levels of activism than conservatives. Abramowitz (1) similarly found that liberals participated in and desired more political activity than conservatives, who are by definition in support of the *status quo*.

Results from the present study indicate that the Comrey-Newmeyer and the new items comprising the Con-Lib scale show promise for reliably and meaningfully measuring ideological orientations. Further work is needed to assess their usefulness with larger, cross-sectional samples.

REFERENCES

1. ABRAMOWITZ, S. I. The comparative competence-adjustment of student left social-political activists. *J. Personal.*, 1973, **41**, 244-260.

2. COMREY, A. L., & NEWMAYER, J. A. Measurement of radicalism-conservatism. *J. Soc. Psychol.*, 1965, **67**, 357-369.
3. KERPELMAN, L. C. Student political activism and ideology: Comparative characteristics of activists and nonactivists. *J. Counsel. Psychol.*, 1969, **16**, 8-13.
4. MCNEMAR, Q. *Psychological Statistics*. New York: Wiley, 1969.
5. MILLER, J. Locus of control, political ideology, and student activism. Unpublished Masters thesis, Texas A & M University, College Station, Texas, 1973.
6. ROBINSON, J. P., RUSK, J. G., & HEAD, K. B. Measures of Political Attitudes. Ann Arbor, Mich.: Inst. for Soc. Res., 1969.

Department of Psychology

Texas A & M University

College Station, Texas 77843

RESPONSIVENESS TO HUMOR: ITS DEPENDENCY UPON A COMPANION'S HUMOROUS SMILING AND LAUGHTER*

University of Wales Institute of Science and Technology

ANTONY J. CHAPMAN AND WENDY A. CHAPMAN

SUMMARY

This experiment was designed to demonstrate that there are social aspects to "humorous laughter," and to examine whether a child's humorous laughter, smiling, and judgments of funniness are differentially facilitated by a companion's humorous smiling and laughter. Independent groups of seven- and eight-year-old children (a total of 45 boys and 45 girls) listened to humorous material with nine-year-old confederate-companions who were trained to respond to prerecorded on-line directions. The humorous material was presented through headphones, as were the directions which were varied systematically and related to laughter and smiling behavior. Subjects and companions were of the same sex. Amount of companions' laughter, amount of smiling, and sex of subject/companion pairs were varied in a $3 \times 3 \times 2$ design. Increases in the companions' laughter led to enhanced laughter, smiling, and ratings of funniness in subjects, who also expected companions to rate the material as more funny. Increases in the companions' smiling resulted in increased smiling from subjects.

A. INTRODUCTION

In a recent review of laughter in children, Rothbart (20) acknowledges that laughter is an important social response, yet she omits to point out that social aspects of situations are important determinants of overt responsiveness to humor. In another theoretical analysis, Giles and Oxford (11) implied that humorous laughter and social laughter are mutually exclusive phenomena. However, the few available studies of laughter tend not to support this notion. Social psychological variables, in the form of the presence and behavior of others, have been shown to influence responsiveness to humor in several adult studies (e.g., 17, 21), and there is evidence from

* Received in the Editorial Office on August 16, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

early observational work that young children laugh less when they are alone than when they are in groups (e.g., 3, 9, 12, 14).

Chapman (5) has demonstrated that children in isolation laugh and smile less than children in naturalistic dyads: laughter-evoking recordings were presented through headphones, and subjects were seven and eight years of age. It seems likely from that experiment that another person's laughter can constitute a facilitative influence, and this is in line with studies that have shown that canned laughter enhances responsiveness to humor (e.g., 4, 15, 18).

Smiling and laughter seem to have different phylogenetic origins (*cf.* 8, 13), and it may not be possible to classify their various forms on a single dimension. Nevertheless, both laughter and smiling can be associated with humor appreciation, and they converge functionally in this respect. It is often assumed in humorous situations that smiling is an attenuated form of laughter (2), and this is partly because smiles are less explosive in character. Smiling may also facilitate mirth, therefore, but it may be less effective than laughter in this respect; it is likely, for example, that smiles unlike laughter rarely constitute laughter stimuli *per se*.

Funniness judgments, like behavioral responses, have been socially facilitated in some studies (e.g., 5) and depressed in others (e.g., 15), but the presence of companions has not always had an influential effect (e.g., 21). Early researchers tended to neglect their own presence and behavior and they probably promoted socially desirable responses, but it appears overall that responses to humor are more susceptible to social influence than are subjective ratings of humor appreciation.

This experiment was designed to demonstrate that responses to humor are dependent to a large extent upon the companion's behavior and, specifically, to examine whether the vocal and nonvocal forms of a companion's mirth behavior differentially facilitate children's laughter, smiling, and ratings of funniness.

B. METHOD

1. Subjects

Ss were 45 boys and 45 girls, aged 7 and 8 years and selected, on the basis of age alone, from a middle-class junior school in Leicestershire, England.

2. Confederates

Five girls and five boys were selected to act as confederate-companions. They were nine years of age and from the same school as Ss. Each performed

once in nine treatment conditions after receiving several days' training in groups of varying size. The training ensured that they appeared to behave naturally while in fact adhering to the prerecorded directions which were presented continuously: the directions related to their laughter and smiling behaviors. These children were acquainted with procedures, but experimental hypotheses were not discussed with them. They were given guidance on how to maintain the deception outside the laboratory. Information from teachers and brief posttest conversations with Ss suggested that no S had suspected that their companion was either an accomplice of the experimenter or a frequent visitor to the laboratory.

3. Apparatus and Testing Environment

The children were observed under standard physical conditions in a dual-compartment mobile-laboratory which was specially designed for research with children. It was located in a secluded part of the school grounds. observations were made through a one-way screen which was an integral part of the dividing partition and was approximately 25 centimeters above the children's seated eye-levels. Humorous material was presented to Ss through a Heathkit stereophonic tape recorder and Lafayette (F-367) headphones. The confederates' headphones were connected to the second (independent) channel of the tape recorder. The dependent behaviors and confederates' performances were monitored by two observers.

4. Material

The humorous material comprised a story and a song which were of eight minutes five seconds, and three minutes 33 seconds duration, respectively. The story was *The Funny Green Hair* (In H. E. Todd's book, *Bobby Brewster's Camera*. Leicester: Brockhampton Press, 1959) and was professionally recorded for this research. The song was Charles Penrose's *The Laughing Policeman* (Columbia Records SEG 7743).

5. Design

A $3 \times 3 \times 2$ factorial design was adopted, varying three levels of laughing and three levels of smiling for confederates, who were paired with Ss in like-sex coaction dyads.

6. Dependent Measures

Laughter was operationally defined as inarticulate vocal sounds, taking a reiterated ha-ha form, and smiling was defined as an upward stretching of

the mouth occurring without vocal sound; it was recognized, however, that a loud exhalation of breath sometimes occurs at the genesis of a smile.

Measures were obtained of total time spent laughing, total time spent smiling, and total time spent looking at the confederate's face. Funniness ratings were elicited by asking Ss whether they had thought that the material was "not very funny," "quite funny," or "very funny." Ss were also asked to guess what their "friend" (the confederate was about to say in reply to the same question).

7. Procedure

Ss listened once only to the humorous recordings and were told that they were assisting in the selection of material for a library. They were randomly assigned to conditions: five boys and five girls were tested in each condition.

The confederates' response patterns were derived from detailed observations of children listening to the same material in naturalistic dyads. In particular, the instructions were based upon response profiles of children who had looked minimally at their companions: confederates did not once look at the Ss' faces during experimental sessions. On average, the confederates' laughter and smiling levels were as follows:

1. LAUGHTER: (a) *Frequent Laughter*—18 laughs totalling 60 seconds; (b) *Intermediate Laughter*—13 laughs totalling 36 seconds; (c) *Zero Laughter*—no laughter at all.

2. SMILING: (a) *Frequent Smiling*—19 smiles totalling 126 seconds; (b) *Intermediate Smiling*—19 smiles totalling 74 seconds; (c) *Zero Smiling*—no smiling at all.

While Ss invariably glanced or gazed at confederates when the latter laughed, they sometimes failed to notice the confederates' smiles. In "Frequent Smiling" and "Intermediate Smiling" conditions, Ss looked at confederates, on average, for 71 and 42 seconds of the latter's smiling.

C. RESULTS

The mean laughter, smiling, and looking scores are presented in Table 1. Analyses of variance indicated that increases in the confederate-companion's laughter tended to augment Ss' scores on each of the dependent behaviors: viz, laughter ($F = 22.67$, $df = 2/72$, $p < .005$), smiling ($F = 14.92$, $df = 2/72$, $p < .005$), and looking ($F = 3.63$, $df = 2/72$, $p < .05$). However, there was no significant difference in laughter scores for Ss in Intermediate and Frequent Laughter conditions ($t = 1.57$, $df = 58$, $p < .10$). Increases in the companions' smiling also tended to enhance scores, but the facilitative

TABLE 1
MEAN LAUGHTER, SMILING, AND LOOKING SCORES IN SECONDS
($n = 5$ in each cell)

Confederates	Subjects	Frequent Smiling		Intermediate Smiling		Zero Smiling	
		Boys	Girls	Boys	Girls	Boys	Girls
Frequent Laughter	Laughter	7.0	13.0	9.0	9.4	7.8	9.0
	Smiling	24.8	19.6	15.6	14.0	17.2	16.2
	Looking	68.1	108.4	73.1	61.9	77.5	72.9
Intermediate Laughter	Laughter	6.4	12.2	9.8	7.4	5.2	7.0
	Smiling	15.4	23.6	15.8	15.8	14.4	12.6
	Looking	66.2	66.2	64.9	81.5	48.4	59.6
Zero Laughter	Laughter	4.0	3.8	1.6	1.0	1.2	.2
	Smiling	13.4	14.0	7.2	8.2	3.0	3.8
	Looking	71.6	55.9	59.4	38.0	46.6	72.6

effect was significant for smiling only ($F = 7.93$, $df = 2/72$, $p < .005$): the mean smiling scores for the three sets of conditions were significantly different from one another. Consistent with behavioral trends, children tended to give higher funniness ratings as confederates laughed more ($\chi^2 = 10.00$, $df = 4$, $p < .05$), but there was no corresponding association between ratings and level of confederates' smiling. There were no significant interactions in the factorial analyses, and no sex differences emerged in any statistical analysis.

Interrelationships between ratings and laughter and smiling responses were identified after dividing Ss into above and below median scores on each of the two behavioral measures. It was found that children who offered the higher ratings tended to laugh most ($\chi^2 = 8.31$, $df = 2$, $p < .02$) and to smile most ($\chi^2 = 6.24$, $df = 2$, $p < .05$) and, in general, the children who laughed most also smiled most ($\chi^2 = 7.81$, $df = 1$, $p < .01$). Fisher exact probability tests indicated that the latter relationship held in every condition.

There was also a clear positive association between the confederates' levels of laughing and the ratings expected from them ($\chi^2 = 28.6$, $df = 4$, $p < .001$), but there was no equivalent relationship between level of smiling and expected ratings.

D. DISCUSSION

This experiment demonstrates that responsiveness to humor is to some extent dependent upon a companion's behavior: it is shown for the first time that responses to humor can be influenced by both the laughter and the smiling of a companion. In dyadic coaction situations, the confederate-companions' laughter facilitated both laughter and smiling responses. Similarly,

smiling scores were enhanced by increments in the confederates' levels of smiling, but there were no corresponding increases in laughter scores. The looking data indicate that the companions' laughs attracted more attention than their nonvocal forms of humor response, but there were nevertheless clear differences in amount of smiling perceived by the groups of subjects in the three sets of smiling conditions.

Subjects rated the material as more funny when companions laughed more, but not when they smiled more. However, there were also positive relationships between the subjects' ratings and their own laughter and smiling responses: the children who rated the recordings as most funny tended to be the children who laughed most and who smiled most. Associations between ratings and behavioral responses may simply be attributable to individual differences, but they could also be a function of dissonance (10) or a function of the subjects' exposure to their own enhanced responses (1).

Most humor studies have relied upon subjective ratings and have not incorporated behavioral measures of humor appreciation. The present results support the assumption that is implicit in most of these studies: namely, that attitudinal reactions and affective expressions constitute equivalent indices of humor responsiveness.

It had been intended that the companions' smiles should be interpreted purely as responses to the humorous material and not as nonmirthful or sociable behavior; this interpretation was encouraged through the timing of responses and the absence of eye contact. Nevertheless, the subjects' predictions of their companions' ratings were related to the companions' laughter but not to their smiling. While the amount that companions laughed seems to have served as an index of amusement, their smiling was apparently disregarded when subjects attempted to gauge their degree of humor appreciation. The laughs may simply have been better remembered than smiles. More probably subjects may have construed smiling as a low intensity form of humor response which did not necessarily indicate that the material would be described as funny.

It was noted informally during testing that smiles often preceded and terminated bursts of laughter and that individuals occasionally vacillated between the vocal and nonvocal forms of response. The experiment is in line with others (e.g., 7, 19) in showing that subjects who laugh most tend to smile most. Although results as a whole tend to support the view that smiling is an attenuated form of laughter, the possibility remains that laughs and smiles may sometimes function as alternative responses.

The processes through which laughter and smiling may be socially facili-

tated have been discussed elsewhere (5). The mere presence of others, for example, has been shown to be an important determinant of reactions to humor, but there has, as yet, been no research into the differential effects of social variables on various types of humor. However, McGhee (16) and others have observed that a purely cognitive form of humor usually evokes less laughter than a form which relates to salient emotional tendencies or needs, and this may be due partially to social factors. There is also some evidence that humor responsiveness can provide a *sub rosa* means of communication (e.g., 6). Although data are in short supply, responsiveness to humor appears to be a complex social psychological phenomenon.

REFERENCES

1. BEM, D. J. Self-perception: An alternative interpretation of cognitive dissonance phenomenon. *Psychol. Rev.*, 1967, **74**, 183-200.
2. BERLYNE, D. E. Laughter, humor and play. In G. Lindzey & E. Aronson (Eds.), *Handbook of Social Psychology* (2nd ed.). Cambridge, Mass.: Addison-Wesley, 1969.
3. BRACKETT, C. W. Laughing and crying of preschool children: A study of the social and emotional behavior of young children as indicated by laughing and crying. *Child Devel. Monog.*, 1934, No. 14.
4. CHAPMAN, A. J. Funniness of jokes, canned laughter and recall performance. *Sociometry*, 1973, **36**, 569-578.
5. ———. Social facilitation of laughter in children. *J. Exper. Soc. Psychol.*, 1973, **9**, 528-541.
6. DAVIS, J. M., & FARINA, A. Humor appreciation as social communication. *J. Personal. & Soc. Psychol.*, 1970, **15**, 175-178.
7. DING, G. F., & JERSILD, A. T. A study of the laughing and smiling of preschool children. *J. Genet. Psychol.*, 1932, **40**, 452-472.
8. EIBL-EIBESFELDT, I. *Ethology: The Biology of Behavior*. New York: Holt, Rinehart & Winston, 1970.
9. ENDERS, A. C. A study of the laughter of the preschool child in the Merrill-Palmer Nursery School. *Papers of the Michigan Academy of Science, Arts and Letters*, 1927, **8**, 341-356.
10. FESTINGER, L. *Theory of Cognitive Dissonance*. Evanston, Ill.: Row, Peterson, 1957.
11. GILES, H., & OXFORD, G. S. Towards a multidimensional theory of laughter causation and its social implications. *Bull. Brit. Psychol. Soc.*, 1970, **23**, 97-105.
12. GREGG, A., MILLER, M., & LINTON, E. Laughter situations as an indication of social responsiveness in young children. In D. S. Thomas (Ed.), *Some New Techniques for Studying Social Behavior*. New York: Teacher's College, 1929.
13. HOOFF, J.A.R.A.M. VAN. A comparative approach to the phylogeny of laughter and smiling. In R. A. Hinde (Ed.), *Non-Verbal Communication*. Cambridge, England: Univ. Press, 1972.
14. KENERDINE, M. Laughter in the preschool child. *Child Devel.*, 1931, **2**, 228-230.
15. LEVENTHAL, H., & MACE, W. The effect of laughter on evaluation of a slapstick movie. *J. Personal.*, 1970, **38**, 16-30.
16. MCGHEE, P. E. The development of the humor response: A review of the literature. *Psychol. Bull.*, 1971, **76**, 328-348.

17. MORRISON, J. A. A note concerning investigations on the constancy of audience laughter. *Sociometry*, 1940, 3, 179-185.
18. NOSANCHUK, T. A., & LIGHTSTONE, J. Canned laughter and public and private conformity. *J. Personal. & Soc. Psychol.*, 1974, 29, 153-156.
19. ROBERTS, A., & JOHNSON, D. Some factors related to the perception of funniness in humor stimuli. *J. Soc. Psychol.*, 1957, 46, 57-63.
20. ROTHBART, M. K. Laughter in young children. *Psychol. Bull.*, 1973, 80, 247-256.
21. YOUNG, R. D., & FRYE, M. Some are laughing; some are not—why? *Psychol. Rep.*, 1966, 18, 747-754.

Department of Applied Psychology

UWIST

Llwyn-y-Grant Road

Cardiff, U.K.

GROUP STRESS, CRITICISM BY A SUBORDINATE, AND THE USE OF POWER*¹

Department of Social Sciences, Clarkson College of Technology

EUGENE M. FODOR²

SUMMARY

This study investigated allocation of rewards by 60 appointed group leaders to fictitious members of a work crew under varying conditions of group stress. The general design of the experiment took the form of an industrial simulation. The presence of a work crew in the next room was simulated by comments made to the group leader through an intercom system. Subjects were expected to perceive group stress at its highest level in an experimental condition that depicted a member of the work crew as disparaging the experimental task and as thereby having a discernibly deteriorating influence on the morale of the remainder of the group. An internal analysis of the data revealed that student supervisors who rated amount of group stress as subjectively high distributed rewards differently from those who rated stress as low. Specifically, they gave higher creativity ratings on models constructed to a worker who criticized the supervisor's performance ($p < .05$) and higher pay raises both to the critic ($p < .05$) and to a noncritical compliant worker ($p < .05$).

A. INTRODUCTION

Previous research has examined the influence on use of power by an appointed group leader either of group stress or of a negative attitude exhibited by a member of a simulated work group (1, 2, 3, 4, 6). Of particular concern in several of these studies has been the group leader's response to a member of the group who was an ingratiation (1, 2, 3, 6). The present investigation represents an extension of previous work by considering the leader's response

* Received in the Editorial Office on August 19, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The research reported herein was supported by Grant MH 21568-02 from the National Institute of Mental Health. Grateful acknowledgement is expressed to Victor Kamhi and Peter Pagaray who served as experimenters.

² Requests for reprints should be sent to the author at the address shown at the end of this article.

not to an ingratiation but to a worker who criticizes the leader's performance. Criticism of one's superior, it was reasoned, constitutes a form of behavior which is the logical opposite of ingratiation and which probably occurs in the organizational setting approximately as often.

Group stress brought about by the presence of a problem worker has not been found to increase the leader's allocation of rewards to an ingratiation. Greater benefits have been found to accrue under conditions of stress (as opposed to absence of stress) to a group member who unobtrusively complies with the demands placed upon him. An interpretation consonant with this finding is that when confronted with a situation of deteriorating group morale, the leader dispenses his powers in a manner calculated to gain support for the exercise of his authority. Only if he can command the affection, or at least the respect, of some members of the group can he, through use of the powers at his disposal, possibly hope to ameliorate the adverse group atmosphere. Should this view of the leader's reaction to group stress be correct, one might reasonably predict that under conditions of group stress (as opposed to absence of stress), the leader will distribute greater benefits not only to a compliant worker but also to a member of the group who criticizes the leader's competence—so long as the critic himself is not responsible for the stress state of the group.

The general procedure of the experiment was a modification of the industrial simulation employed in studies by Goodstadt and Kipnis (4) and Kipnis and Vanderveer (6). Group stress was created by having a member of the work group express an unfavorable attitude toward the experimental task he was asked to perform. In the process of so behaving he was observed by the leader to have a deteriorating impact on the morale of the remaining workers.

B. METHOD

1. *Subjects*

Participants were men drawn from the freshman class at Clarkson College of Technology. They were paid \$3 for their cooperation. There were three experimental groups of 20 subjects each. Nineteen of the total of 79 students (24 percent) in the experiment were removed from the data analysis because they denied the existence of workers in the next room (who were actually fictitious).

2. *Procedure*

The purpose of the industrial simulation was explained to subjects upon their arrival at the laboratory as a study of managerial ability. They would

play the role of supervisor by directing construction of Tinker Toy models by three high school boys in the next room. These boys were to design models which would be evaluated by the supervisor on level of creativity—a different model on each of four five-minute trials. Preceding his entrance into the experiment, the supervisor was told, the work crew had had 15 minutes to think about the models they would design. The supervisor was informed that each worker would receive a base pay of one dollar for his work and that he was authorized to give workers a 10¢ increase or decrease in pay at the end of a given trial. The three boys in the next room were actually nonexistent.

The supervisor was expected to use all means at his disposal in an effort to foster higher creativity in his work crew. These, he was told might include words of encouragement, reprimands, promises of pay increase, and general advice on construction. He could speak to his workers by means of a one-way communication device comprised of a microphone and also of a switch and light signal for contacting individual workers. Communications allegedly coming from the various workers consisted of preprogrammed tape recordings play-acted by high school students of the writer's acquaintance. Careful pretesting indicated that the voices of these three boys were distinguishably different. The experimenter explained that the supervisor could not be allowed to see the workers because the impressions thereby acquired might bias his evaluations.

Models attributed to the various workers were designed in advance and were independently judged for level of creativity on a nine-point scale by each of three persons. Models were distributed across workers in such a way that the mean and exact distribution of creativity scores, as determined by the judges' ratings, were identical. As an additional precaution against actual differences between workers in the creativity level of models attributed to them, the set of models assigned to individual workers was systematically rotated for each successive supervisor.

At the completion of each trial, the student supervisor would hear through an intercom system tape recordings which simulated comments by the three workers. Immediately thereafter the supervisor's assistant would arrive with the model allegedly constructed on that trial by each worker.

There were three treatment groups in the experiment. The first of these was designed to create a condition of group stress through the behavior of Man A who disparaged the experimental task and thereby had a deteriorating impact on the morale of the remainder of the work crew. On trial 1 he commented, "This job strikes me as kind of dull and I'm getting bored." Trial 3 produced the following exclamation: "What a lot of nonsense! Do

you people really think you can learn something by watching us put together tinker toys?" Man A finished trial 4 by declaring, "So much for a total waste of time! I'm glad it's over."

Man B was typed as a worker who complied with the demands of the supervisor but who on occasion expressed annoyance with Man A. Upon completion of trial 1 he said, "I think I could do a better job but Man A really bugs me." On trial 2: "I've never done anything like this before. It's a new experience." Trial 3 ended in another complaint about Man A: "Man A is really getting to us. His poor attitude disturbs our thought and lowers our morale." On trial 4 Man B asked, "This is the last trial, isn't it?"

Man C repeatedly criticized the supervisor's competence. Trial 1 brought the following comment: "I hope you're not planning to be a supervisor when you graduate. You're not very good at it." On trial 2 he communicated his irritation with Man A by exclaiming, "I wonder why Man A ever volunteered for this experiment!" On trial 3: "If you don't like my models, it's your own fault. You haven't given me one good idea." And finally at the conclusion of trial 4, "Almost done but, frankly, you haven't been much help."

Condition 2 exactly replicated condition 1 except that there were no comments of dissatisfaction from Man B and C about Man A's attitude. Substituted for these statements were comments of a strictly neutral character. Condition 2, then, consisted of an unfavorable attitude on the part of Man A but without a total situation of group stress.

Man A did not exhibit an unfavorable attitude toward his job in condition 3 of the experiment. Instead, he made neutral statements like, "These tinker toys are always falling on the floor, but I guess that's life." Man B, the compliant worker, and Man C, the critic, made the same remarks as in condition 2.

3. *Dependent Measures*

How supervisors allocated the various rewards at their disposal was determined by means of three different measures. First, the supervisor was instructed to supply creativity ratings on a nine-point scale of all models designed during a given trial. Second, he was permitted to raise or lower a worker's salary by 10¢ a trial. At the conclusion of the four trials the supervisor was taken to a different room where he completed for each worker a performance evaluation comprised of four separate nine-point scales: (a) worker's ability, (b) worker's overall worth to the company, (c) willingness to rehire worker for a second experiment, and (d) recommendation that the worker be promoted to supervisor in a future experiment. For purposes of

analysis, these four scale scores were summed to obtain a single overall score. Subjects were asked to indicate on an additional nine-point scale the amount of stress they thought had characterized the atmosphere of their work group.

During the postexperimental interview, subjects were closely interrogated to determine whether they suspected the real purpose of the experiment. The details and underlying rationale of the study were then explained to them and they were sworn to secrecy.

C. RESULTS

Group stress was perceived to be greatest for condition 1, the group stress situation, next greatest for condition 2, where Man A showed a negative attitude toward the job, and least prevalent in condition 3, the control condition. These differences were not large—5.15, 4.8, and 4.5, respectively—and did not attain significance ($F < 1$, $df = 2, 57$).

A multivariate analysis of variance was performed to determine whether there was a differential allocation of rewards to Man B and Man C under the three conditions of the experiment. A nonsignificant value of 2.15 was obtained for F . A significant main effect ($F = 5.91$, $p < .05$) was found for worker (Man B *versus* Man C). Man B, not surprisingly, was more favored by the supervisor than was the critic.

In order meaningfully to examine the hypothesis entertained at the outset of the experiment, the decision was made to consider all subjects in condition 1 and 2 who subjectively rated the amount of group stress as high (points 7, 8, and 9 on the nine-point scale). Eight subjects met that criterion. Condition 3 contained eight subjects who rated group stress at 2 or 3 (none gave a rating of 1). Data appear in Table 1 for the internal analysis hereby suggested. Under group stress as now defined, student supervisors by all three measures consistently rated Man C, the critic, and Man B, the compliant worker, higher than was the case in the absence of high stress. A multivariate analysis of variance of these data yielded an F value of 3.92 ($p < .10$) for the main effect of stress level and an F value of 3.26 ($p < .10$) for the main effect of worker. Univariate analyses of variance were then performed to trace the source of these marginally significant multivariate effects [see Hummel and Sligo (5)]. Differences in stress level produced significant effects for the variables of creativity rating ($F = 5.13$, $p < .05$) and pay raises ($F = 9.41$, $p < .01$) but not on the variable of performance rating ($F = 2.21$, $p < .25$). When the data were examined in this way, only one main effect was found for the condition of worker and that was on the variable

TABLE 1
MEAN CREATIVITY RATINGS, PAY INCREASES, AND PERFORMANCE EVALUATIONS
GIVEN MAN B (A COMPLIANT WORKER) AND MAN C (A CRITIC)

Level of group stress	Evaluation dimension					
	Creativity		Pay		Performance	
	Man B	Man C	Man B	Man C	Man B	Man C
High ($n = 8$)						
Mean	26.5	26.2* _a	22.5* _b	17.5* _c	29.1	23.7
SD	3.5	4.1	10.9	6.6	3.6	5.7
Low ($n = 8$)						
Mean	24.4	21.4* _a	12.5* _b	6.3* _c	26.0	20.9
SD	2.3	3.6	9.7	7.0	4.9	5.5

* The means with subscripts (a, b, c) are significantly different from each other, $p < .05$.

of performance evaluation ($F = 8.50$, $p < .01$). No interaction effects were revealed through these analyses.

To determine whether main effects attributable to differences in stress level pertained to both Man B and Man C or only to one of the two, analyses were performed by means of Tukey's HSD test. Only Man C, the critic, received a significantly higher creativity rating under high stress ($p < .05$), while both men got higher pay under those circumstances ($p < .05$).

D. DISCUSSION AND CONCLUSIONS

The finding that group stress resulted in the supervisor giving Man C higher creativity ratings and both Man B and C more pay raises but not higher performance evaluations accords rather neatly with the rationale behind the experimental hypothesis. The supervisor was expected to use the powers at his disposal as a means of soliciting support in a time of group crisis. He could obviously do this with creativity ratings and pay raises (which supervisors typically communicated directly to their workers), since they were administered during the course of the work trials. Performance evaluations, on the other hand, could not be used in this manner because they were completed only after the experiment was over. That group stress did not bring about higher performance evaluations therefore makes perfectly good sense.

It will be recalled that corroboration of the experimental hypothesis could occur through this internal analysis only if subjects who rated level of group stress as high also gave high ratings in other ways as well, thereby raising the specter of a possible acquiescent response set. A check on the likelihood of such an occurrence was made by considering ratings made by

supervisors at the end of the experiment on how cooperative they felt the group had been. Should supervisors who rated group stress (and everything else) as high also rate cooperativeness of the group as high, that finding would signal that acquiescence might be a factor accounting for the pattern of results obtained. Happily, this was not the case. Subjects in the "high stress" group gave a mean rating of 5.9 on group cooperativeness, while those in the "low stress" group yielded a mean of 6.0.

That student supervisors confer greater rewards on a compliant worker under conditions of stress accords well with previous research findings (3, 4, 6). The finding that they also allocate greater benefits under these conditions to a member of the work crew who criticizes them suggests that group stress may prompt supervisors to employ something like reverse-ingratiation whereby they use their powers in an endeavor to build a situation more conducive to the exercise of their leadership role. This explanation also accounts well for failure of past experiments to find increased supervisory responsiveness to an ingratiation under conditions of stress (1, 2, 3, 6). The ingratiation has already expressed his support; hence the supervisor may perhaps feel no compelling need to win him over.

REFERENCES

1. FODOR, E. M. Disparagement by a subordinate, ingratiation, and the use of power. *J. of Psychol.*, 1973, **84**, 181-186.
2. ———. Group stress, ingratiation, and the use of power. *J. Soc. Psychol.*, 1973, **91**, 345-346.
3. ———. Disparagement by a subordinate as an influence on the use of power. *J. Appl. Psychol.*, in press.
4. GOODSTADT, B., & KIPNIS, D. Situational influences on the use of power. *J. Appl. Psychol.*, 1970, **54**, 201-207.
5. HUMMEL, T. J., & SLIGO, J. R. Empirical comparison of univariate and multivariate analysis of variance procedures. *Psychol. Bull.*, 1971, **76**, 49-57.
6. KIPNIS, D., & VANDERVEER, R. Ingratiation and the use of power. *J. Personal. & Soc. Psychol.*, 1971, **17**, 280-286.

Department of Social Sciences
Clarkson College of Technology
Potsdam, New York 13676

SEX-ROLE STEREOTYPES: PERCEIVED CHILDHOOD
SOCIALIZATION EXPERIENCES AND THE
ATTITUDES AND BEHAVIOR OF
ADULT WOMEN*

Phoenix, Arizona

CELIA M. HALAS

SUMMARY

Spence-Helmreich's (13) *Attitude Toward Women Scale* and a questionnaire developed by the author were administered to 63 mature women community college students and to their acquaintances who were not enrolled in school. All were married or previously married. Investigation concerned (a) the association of perceived early socialization experiences with sex-role stereotypes in the attitudes and behavior of mature women, and (b) the impact of the Women's Liberation Movement upon these women. A second phase of the study consisted of case studies of eight subjects selected from among those whose scores on the *Attitude Toward Women Scale* indicated very liberal or very traditional ideologies.

Results revealed that a large majority of subjects in both groups reported stereotyped childhood socialization experiences relating to career aspirations, education, recreational literature, and romantic anticipation of marriage. These women's adult lives were characterized by low levels of education, few employable skills, and traditional attitudes and behavior. Subjects who recalled wide social experiences and a lack of stereotyped reinforcement made wider education choices. They reflected more liberal attitudes and behavior in their adult lives. These latter were a small minority in both groups. Sex-role stereotypes were revealed in the present attitudes and behavior of most subjects in both groups including women who saw themselves as liberated. In a projective exercise subjects showed a strong tendency to place their own needs below those of their husbands and children, to meet their own needs through extraordinary effort only after their families' needs were met, and to rationalize their behavior in the rare instances where they put their own ahead of their families' needs. There was a marked dissatisfaction with past education among both groups. Subjects reported more positive than

* Received in the Editorial Office on August 19, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

negative feelings about the Women's Liberation Movement; there was a strong trend among subjects with liberal ideologies to perceive themselves as having been influenced by the feminist movement.

A. INTRODUCTION

The symptoms and presenting problems of many women clients suggest that their lives have been limited as a result of sex-role socialization. Early childhood socialization experiences which shape women's lives and influence their personalities and choice of goals have recently become the focus of investigation. Alert professional workers recognize that the roots of many women's personal and vocational problems lie in pervasive sexism which in our culture has placed females in a subordinate relationship to males. From their earliest years young girls are taught to be obedient, docile, and cooperative, while boys are reinforced toward initiative, achievement, and mastery (12).

Young girls are encouraged to view marriage as the only totally appropriate and fulfilling role for women, while they are discouraged from alternative educational and career choices (1, 2, 3, 6, 10, 11). However, stereotyped preparation for marriage, while eliminating other options, may not include realistic preparation for the hardships and responsibilities of marriage. Females who experience external discriminatory pressure during their developmental years tend to internalize stereotyped limitations (7). They learn to be obedient, docile, and cooperative. One of the unfortunate effects of this passive role is that it is at odds with the trends of western civilization where the emphasis is upon individual freedom and individual responsibility. At odds with the values of our culture's education and philosophy, women face frustration and bewilderment in their mature years. As clients they present themselves for therapy to professionals who are limited in their understanding of women's needs by a lack of adequate research on the psychology of women (4).

One main thrust of the feminist movement has been to show that women in our society are disadvantaged by socialization practices and by institutional arrangements (5). Feminist writers have recommended changes not only in society but in the way research on sex differences is conducted. They have suggested that research on women which views women as "not-men" and equates "different" as "deficient" does a disservice to both scholarship and women (8, 9, 14). Weisstein (14) pointed out that persons' self-concepts and behaviors are a function of what people around them expect them to be.

She suggested a study of socialization factors rather than of inner dynamics if we hope to understand women. Carlson (4) suggested that the study of women as individuals was a needed first step in developing new models for feminine research.

In contrast to earlier theories which offered little hope for personality change Westervelt (15) maintained that ideologies about women can gradually modify attitudes and behaviors which have been previously regarded as the core of femininity. She saw feminist ideologies modifying women's role perceptions and expectations by heightening their awareness of the unsatisfying elements and narrow limits in their traditional roles. Although she did not see women as rejecting their traditional roles altogether, she saw traditional roles as losing their capacity to totally dominate the life plans of women who had moved to accept egalitarian values through exposure to the Women's Liberation Movement.

B. PROBLEM

This study was designed to examine the relationship between perceived early childhood socialization experiences related to education and role choices of women, and their attitudes and behavior as adults. It further investigated the influence of feminism as a variable related to ideological change in mature women.

In recent years many thousands of mature women have returned to college campuses to resume their educations. One purpose of this study was to examine what factors motivate mature women either to resume or not to resume their education after an interruption of several years. Although educational and role choices are made relatively early in a woman's life, they influence the scope and conduct of her whole life. Explanations are needed for the lower level of educational aspiration and achievement by women and for the fact that virtually all women in the United States are married at some time in their lives. A second purpose of the study was to seek evidence that childhood socialization experiences are associated with women's educational and role choices.

Traditional ideology reflects the view that women's primary responsibilities are homemaking and childrearing, that women with children should not have a career, that men are responsible for the financial support of their families, and that a double standard in social practices is acceptable. In contrast, liberal ideology holds that relationships between men and women are ideally egalitarian, and that husbands and wives may share domestic, childrearing, and financial responsibilities. A third purpose of this study was to investigate

the association between traditional or liberal ideologies in adult women and their perceived childhood socialization experiences.

Mental health clinicians who work with women clients recognize in these women feelings of low self-esteem, lack of autonomous feelings, depression, and feelings of hopelessness. Even the more functional mature women who return to college generally display a level of aspiration considerably below their level of ability. Another purpose of the study was to look for indications that childhood socialization experiences are associated with adult women's attitudes and behavior. A further purpose of the study was to determine to what extent the Women's Liberation Movement had made an impact upon, and how it was perceived by, subjects in the study.

C. METHODS

1. Subjects

A review of the literature revealed the need for qualitative as well as quantitative analysis in research on the psychology of women. A two-phase study combined in-depth qualitative examination of factors revealed in a quantitative survey. It utilized a current and retrospective survey augmented by case studies. Samples from two populations were investigated: (a) 38 mature, married, or previously married, women who were attending a community college after being out for at least three years, and (b) 25 non-student acquaintances of the first group, who met the same criteria except for school enrollment. Subjects ranged from 22 to 65 years of age. The student group is referred to in this report as Students (S). The nonstudents are termed Housewives (H). The term "mature" used to describe the Ss is in general use in educational literature. It refers to students who have resumed their education after an interruption of several years. Although all subjects in both groups were housewives, the H group is so designated in the report to differentiate them from the Ss who were both housewives and students.

Eight subjects for case studies were selected from among those subjects who scored in the top and bottom quartiles in the *Attitude Toward Women Scale* (AWS). These included two Students and two Housewives from the top quartile and an equal number from the bottom quartile.

2. Source of Data

Data for the first phase of the study consisted of responses on the short form of Spence-Helmreich's *Attitude Toward Women Scale* and a Personal Data Questionnaire (PDQ) developed by the author. All subjects com-

pleted both forms. Data for the second phase of the study contained additional information derived from personal, taped interviews with eight selected subjects. They responded to open-ended questions on a Structured Interview Questionnaire (SIQ) developed and administered by the author.

The short form of the AWS was used to rank subjects according to liberal and traditional attitudes toward women's roles and patterns of conduct. This short 25-item scale was developed by the scale's authors to replace the 55-item scale when a numerical score for each respondent is all that is needed. Correlations between the short and long forms of 1051 subjects were .97 for male and female students and .96 for the fathers and mothers of these students. Items on the AWS relate to vocational, educational, and intellectual roles of women; freedom and independence, dating courtship and etiquette; sexual behavior; and marriage relationships and obligations. Subjects responded with "agree strongly," "agree mildly," "disagree mildly," or "disagree strongly" to each item. Each item is scored from zero-3. Individual scores ranging from a possible high of 75 to a possible low of zero are obtained by summing the values of the individual items. A high score indicates a liberal ideology, while a low score indicates a traditional ideology.

The Personal Data Questionnaire included 60 questions designed to yield data concerning (a) perceived early childhood experiences relating to future goals, education, parental influences, family relationships, and role choices; and (b) variables in the subjects' adult lives which were associated with early socialization experiences. Projective questions, including an incomplete vignette, were designed to test the existence of sex-role stereotypes in current attitudes and behavior. Questions related to the Women's Liberation Movement elicited subjects' opinions of the movement and extent to which they perceived they had been influenced by it. The Structured Interview Questionnaire contained 68 open-ended questions designed to gather in-depth information for case studies. These questions covered at greater depth the topics covered in the PDQ.

3. Procedure

Packets containing the Personal Data Questionnaire and the Attitude Toward Women Scale, with a letter of explanation, were distributed in class to students enrolled in the personal resources class at a community college. Forty-seven students took two packets each; one for themselves and another for an acquaintance not enrolled in school whom they agreed to recruit for the study. The forms were to be completed at home and returned to the researcher in sealed envelopes.

Eighty-three percent of students who took the questionnaires completed them. Several students were unsuccessful in recruiting acquaintances. Sixty-two percent of the "acquaintances'" questionnaires were returned. One student had never married. Her questionnaire and four "acquaintances'" questionnaires, which were too sketchily filled out, were eliminated. Total samples of 38 students (S) and 25 housewives (H) were selected for study.

Data were tabulated and reported for the two sample groups. Where there were differences between the groups, the findings were analyzed for each sample. In instances where the data from the two samples did not differ, they were analyzed together. After ranking all subjects on their AWS responses, eight subjects were selected for case studies from among those identified as holding the most liberal and most traditional ideologies. These subjects were contacted by telephone by the researcher and interviewed in their homes with the use of the Structured Interview Questionnaire.

D. RESULTS

1. *First Phase—General Survey*

a. Differences between groups. Scores on the AWS were analyzed with the use of a *t* test to establish that the samples were from independent populations. This was significant at .0005 level of significance by a one-tailed test. A summary of the data derived from the survey phase of the study revealed that the two groups differed in the following ways. The Hs held more traditional ideologies than the S group ($\bar{X}_S = 57.11$; $\bar{X}_H = 46.88$). Mothers of younger children tended to be in the H group, while mothers among the Ss tended to be older themselves, have older children and larger families, and had relatively lower incomes. Marriage and a lack of finances were cited most often as reasons for leaving school among the Ss, while the Hs gave reasons that indicated a lack of motivation for education beyond the high school level. More Hs than Ss indicated that they would be satisfied financially and personally with the level and status of jobs they considered themselves currently capable of holding ($H = 40\%$; $S = 16\%$). Hs tended to question less than Ss and to accept as appropriate the lower pay and stereotyped feminine jobs for which they were prepared. The H group saw their mothers as happier in their roles ($H = 76\%$; $S = 63\%$), and reported admiring both their mothers ($H = 60\%$; $S = 42\%$) and fathers ($H = 68\%$; $S = 45\%$) more than Ss did. Twice as many Ss as Hs reported that reading had been a favorite pastime in their childhood.

Other results showed that the reasons given by Ss for returning to school were almost equally divided between a felt need to prepare for employment

and to seek personal growth (55% and 53%, respectively). Among the Hs a majority expressed a desire to return to school when their children would be older (68%).

b. Marriage role. Women in both groups reported that they had, at the time they ended their schooling, seen marriage as considerably more attractive than a job for which they were at that time qualified ($H = 69\%$; $S = 61\%$). At the time of the study both groups reported that they had moved in recent years toward a less idealistic view of marriage and toward a greater confidence in a job to satisfy their needs (percentage of change, $H = 38\%$, $S = 44\%$). Although the subjects reported themselves as at least moderately happy in marriage, they did not see their early socialization as having given them an accurate view of what to expect as married women. There was a strong tendency to report that marriage was eagerly anticipated by the subjects and reinforced during their childhood as the ultimate happiness. However, they felt they had received no specific preparation for this role. They found that in their lives the reality of marriage responsibilities differed greatly from their expectations with a noticeable trend of encountering more rather than fewer responsibilities than expected. On an average, they pinpointed more than three areas of responsibility where their dream and their reality differed, with the Ss reporting more divergence than the Hs. Areas of unexpected additional responsibility included unpleasant housework, more outside work, more financial problems, more difficult childrearing, more sickness, and unexpected problems of parents and in-laws. Problems connected with raising children were most often cited.

In a comparison of relative satisfaction with their roles as wife, mother, and homemaker, subjects in both groups reported the highest level of satisfaction in their maternal ($\bar{X}H = 3.48$; $\bar{X}S = 3.22$) and the lowest satisfaction in their homemaker roles ($\bar{X}H = 2.84$; $\bar{X}S = 2.35$) with their marital role satisfaction in between. Hs showed slightly more satisfaction with both homemaker and maternal roles than did the Ss. Both groups showed identical levels of marital satisfaction ($\bar{X} = 3$). In selecting ideal roles for themselves, both groups indicated that they would like ideally to have a husband, children, and part- or full-time work outside the home. In most cases this departed from their expectation when they entered marriage that they would feel totally fulfilled as wife and mother. Subjects who were married a shorter time expressed less desire to add outside activities to their lives.

c. Education. Educational level of the subjects, ranging from tenth grade to past the master's level, was similar for the two groups. Over half had

ended their earlier education with high school graduation. However, more than a quarter of the Ss had more than 14 years of schooling before enrolling in the community college. Nine out of 10 subjects in both groups would have changed their past education if they could. Most frequently mentioned (27%) was a desire to have finished college before marriage. Nearly a third wished that they had taken more math, science, and languages, or that they had stayed in school longer and prepared for a career while in school. Even among the H group there was a desire for more education. Sixty-eight percent of Hs expressed a desire to return to college at a later date, preferably when their children would be older.

Three-fourths of the women in the study indicated that their education had not prepared them for a fulfilling later life. They reported few present day resources which were attributable to school experiences. These women recalled that at the time they ended their schooling they had had no goals, or only family-related goals, for themselves after age 40. However, nine out of 10 subjects reported that at the time of the study they had new or revised goals, trending away from family-related toward work, school, or personal ambitions. There was a strong trend for subjects in both groups to view teachers and counselors as having been negatively influential in their earlier educational planning. For the subjects whose earlier education had progressed beyond high school, most of them reported positive relationships at school, and viewed teachers and counselors as having been encouraging models.

d. Stereotypes in occupational choices. There was an overwhelming trend toward sex-typed selections in the remembered early occupational and role choices of both sample groups. Nine out of 10 subjects remembered wanting to follow "feminine" careers in their earliest fantasies with nurse, "mommy," and teacher being most frequently mentioned (53%). These are the three feminine models most frequently encountered in a girl's earliest years. Adult models were seen by both groups as most inspirational in their early career choices. When their models were primarily stereotyped, the girls limited their role choices to what they saw as possible for women. The subjects reported that as they grew older they changed their occupational and role goals in the direction of even more stereotyped roles. The choice of "mother" increased 220% in popularity between early and later aspirations. No subject moved toward less stereotyped ambitions and all those who had earlier nonstereotyped occupational fantasies later dropped them. These perceptions were corroborated by the actual role choices made in their adult lives.

More than half the subjects in both groups recalled little or no discussion

with their parents of their dreams and goals for the future. Parental pressures were reported in the direction of sex-typed careers in education, art, and secretarial work. Over one-third of the subjects perceived that in their families more boys than girls were expected and encouraged to go to college, while no subjects recalled that the girls in their families had received more educational encouragement and support than their brothers. This was reflected in the adult lives of the siblings. Although five subjects had become teachers or nurses, all the other women had chosen lower status careers. Their brothers, on the other hand, were frequently identified as having high status and professional employment.

More than nine to one, the subjects in both groups remembered their favorite childhood stories to be those which reinforced the development of sex-stereotyped characteristics of passivity and dependence. There was an overwhelming trend toward tales of passivity and wish fulfillment where heroines were rescued and "lived happily ever after." Stories with models of assertion, adventure, achievement, and skill building which would provide active models for emulation were rarely recalled by the women in this study. They, in turn, had made career and life choices which reflected fantasies of living happily ever after.

e. Stereotypes in adult attitude and behavior. Sex-role stereotypes in the attitudes of the subjects in both groups were revealed in their listing of important events in their past lives and achievements for themselves and their husbands. By a margin of two to one, events involving family relationships were listed as most important in the subjects' lives. Often events which did not happen to them personally were included. In listing important achievements for themselves and their husbands during the past five years, the profiles drawn for the two sexes were almost opposite; for husbands in both groups, important achievements were overwhelmingly work-related; for wives, the achievements were largely family-oriented (although several Ss included returning to school as an important achievement). These views follow the stereotypic view held by both men and women that a man's primary responsibility is the economic support of his family. Ss did, however, hold a somewhat less typical view than Hs, reporting more personal achievement for their husbands ($S = 24\%$; $H = 4\%$).

In a projective exercise which was designed to elicit less-defended material concerning role conflicts, subjects in both groups revealed that they would resolve a hypothetical problem in a stereotyped way. They were asked to complete the following vignette in which a choice must be made between family and personal goals.

Joan and Robert are married and have two children. Robert works hard to support the family, but there is little money available for recreation. Joan keeps house and is going to college. They are both looking forward to her working after she graduates.

It is Sunday afternoon. Robert has been given free passes to the zoo and wants to take the family for an outing. Joan has a big exam tomorrow and had planned to spend the afternoon studying. (Finish the story telling what they will do, and why).

A stereotyped response was considered to be one in which the conflict would be resolved in the story by having Joan put aside her own plans and go to the zoo with her family. In 45% of the stories, Joan made a stereotyped response and went on the outing. Eleven percent of the subjects avoided making any decision. Women in the study tended to resolve role conflicts by sacrificing their needs to those of their families, by pleasing their families first and then doing their study through an extraordinary effort on their own part, or, in the rare cases where they did put their needs first, they excused their behavior. Only five subjects suggested a straightforward solution based upon egalitarian standards.

j. Views of Women's Liberation Movement. Among the women in the study, there was a stronger average feeling for than against the Women's Liberation Movement with 82% of Ss and 56% of Hs noting some positive reaction to the movement. The belief that women should receive equal pay for equal work was most often volunteered as the main objective of feminism. Reservations and negative responses were reactions to perceptions of militancy or radical aspects of the movement. Among the Hs, 36% perceived that they had been personally influenced by the Women's Liberation Movement, while 50% of the Ss gave that response.

2. Second Phase—Case Studies

Case studies corroborated the findings of the first phase of the study. In addition, among the women who scored low on AWS (i.e., traditional ideologies), these additional trends were noted: Parents' marital happiness and their function as models are factors which were closely associated with marital happiness and traditional ideologies of women in the study. Women who recalled experiencing a protected childhood with traditionally oriented parents tended to have internalized sex-role stereotypes which were reflected both in their interviews and in their low scores on the AWS. Such women had accepted a submissive role in their marriages and defended the position whether there marriages were happy or not.

Among women who had high AWS scores, indicating a liberal ideology, case studies revealed the following: a pattern of childhood including wide social experiences and the development of autonomy and responsibility as children. No desire to emulate their mothers was evident in this group. Women who sought to reduce sex-role stereotypes in themselves when they became aware of them tended to have a liberal ideology which may, in fact, have followed their efforts to change. A return to school was seen as associated with changing ideologies from traditional to liberal; the broadening of horizons through education was seen as liberation. Clearly, the small number of case studies suggests caution in generalizations. However, in building upon the data from the general survey the case studies provide strong corroboration.

E. DISCUSSION

Childhood socialization experiences as they were recalled by mature women students and their nonstudent acquaintances were associated in this study with the educational and role choices they made in earlier years and the attitudes and behavior they exhibited in their adult lives. The general survey phase of the study demonstrated that most of the subjects recalled childhood experiences that discouraged high educational and career aspirations and that reinforced the ideal of marriage as the ultimate goal for them. The subjects had, in fact, largely made role and career choices following this pattern. Internalized sex-role stereotypes which follow exposure to sexist influences were identified as both the logical development of our childrearing practices and as limiting factors in adult women's lives. Subjects were found to have opinions about, but limited information concerning, the Women's Liberation Movement. There was a strong tendency for women in the study to view themselves as influenced by feminism. Case studies corroborated the findings of the initial survey.

Women students were found generally to hold more liberal attitudes than their nonstudent peers regarding the appropriate roles and behavior for women. Among the exceptions, liberally oriented Hs tended to plan a return to school, while traditionally oriented Ss did not have concrete educational goals. The latter had in some cases planned to discontinue classes at the end of the semester. The Ss' stated motivations for returning to school were equally divided between a felt need to prepare for employment and a wish for personal growth. There was a general agreement that college is a liberating experience and one that modifies traditional ideologies. Whether liberation

came before or as a result of educational experiences seemed to vary among the Ss.

Sex-role stereotypes were evident in the remembered childhood experiences related to educational and role choices of the women. Children make their choices from what they see as appropriate for them and many of the subjects reported having had very little exposure to nonstereotyped models. All of them eventually chose "feminine" roles, an indication that their early experiences were associated with their later status.

Educationally, the subjects in the study recalled very little parental concern with their schooling. In most homes high school was seen as terminal for girls. In contrast, boys in their families often received encouragement and financial support for college. Internalized sex-role stereotypes sometimes prevented women from recognizing this differential treatment. Some subjects who reported that boys and girls in their families received the same educational reinforcement did not see as inconsistent the fact that the girls were expected to marry and were therefore not seen as needing college, while their brothers were encouraged to prepare for careers by attending college. Such adult attitudes seem to be associated with early stereotypes promoted in the home.

Marriage, a role chosen by all the subjects, was retrospectively recognized as a role choice for which they had received considerable reinforcement but little preparation during their early years. Subjects saw themselves as having had largely romantic dreams of perfect happiness as wives, nurtured by childhood fairy tales, without preparation for the realities they would face when married. Few of them received any encouragement toward careers as a fulfilling alternative to marriage. Disillusionment was a common experience as through the years these women found numerous unanticipated responsibilities in marriage. For over half the student group, their current college work was undertaken as a means to meet financial needs for which they felt unprepared. Having terminated their education to marry, there was a strong trend to regret not having finished college first or to have prepared for a career while in school.

Internalized sex-role stereotypes were evident in the subjects' attitudes in responses relating to the subjects' adult lives. Wives saw their own and their husbands' achievements in stereotyped ways. For themselves, they valued family-related achievements; for their husbands, notice was given to work-oriented successes. In educational planning, nearly all subjects limited their aspirations to lower level or "feminine" type career preparation. Case studies revealed stereotypes operating in more obvious ways in subjects who scored

low on the AWS, indicating a traditional ideology. These women held firm to the appropriateness of a dominant-subordinate relationship in marriage. For them these attitudes reflected their own childhood experiences in homes where stereotyped roles were the norm.

A striking indication of the less-than-conscious existence of sex-role stereotypes in the subjects came from projective evidence when they were asked to resolve a conflict presented in the unfinished vignette. An objective analysis of the material in the story would suggest that if there were no stereotyped attitudes a decision would be easy. Given the importance of Joan's education to her family, her feeling of a need to study on one hand, and the appeal of the outing and Robert's ability to take the children alone on the other hand, one could expect the majority of cases to reflect Joan's decision to stay home. Only five subjects made this straightforward choice. Most of the stories indicated other variables associated with feminine stereotypes.

The stories gave considerably more attention to Joan than to Robert, suggesting identification of the authors with the female in the vignette. They suggested that women tend to feel that their plans are not as important as those of others in the family, to feel that they should please their families first and then meet their own needs through extraordinary efforts, and that they experience guilt feelings when they do place their own needs above those of their families. Reasons given for choosing to go on the outings placed Joan's family's wishes and her desire to be a good mother above all else. In many cases, Joan packed a picnic lunch, got supper, bathed the children, put them to bed, and then settled down to study. Several subjects reported Joan's family to be exhausted and happy from a day at the zoo, while they described Joan as "relaxed, exhilarated, and ready to study."

Stereotypes about women's liberation did not fit the subjects in this study. Although several expressed concern about excesses of the movement, there was a strong tendency to agree that feminism was, on the whole, good for society. Even the most traditionally-oriented subjects approved of equal pay for equal work and identified this, without any cues, as the main tenet of the movement. Nearly half of the S group did not associate returning to school with liberation. Although they found their ideas becoming more liberal once they became students, in many cases women saw their liberated attitudes as a response to a change that was already taking place. For many women maturity and the realities of life had caused them to question previously held traditional ideologies and life styles. More than one-third of the H group considered themselves influenced by the feminist movement, although they had chosen to remain at home. One can conclude that the

women in the study did not accept the stereotyped notion that the Women's Liberation Movement is associated with so-called emancipation from home and the disparagement of women who choose to remain at home.

This study was undertaken as a fact-finding endeavor to examine variables not often considered in research on the psychology of women and to suggest areas worthy of further research. A conclusion can be made that stereotyped socialization experiences of young girls are associated with the quality of their lives as adults. The strong trend of subjects who recalled strictly differentiated sex roles in their childhood homes, limited educational encouragement, and narrow social experiences was associated with "feminine" role aspirations, low educational level, and traditional career choices. The few subjects whose early lives were characterized by a relative lack of sex-role stereotypes in their homes, wide social experiences, and encouragement toward independence and autonomy made less stereotyped choices more in keeping with their potential. For them, wider career choices were seen as open to them, education was more highly valued, and sex roles were less rigidly differentiated. So few of these latter were revealed by the study that, at least among the two populations surveyed, there is a strong suggestion of a need for further research. Extensive case studies are called for to pursue in depth socialization factors relating to educational and role choices of young girls and the effects these choices have upon the women's adult lives.

Further, the findings of the study suggest that sex-role stereotypes seem to permeate the attitudes and behavior of adult women even when they view themselves as liberated. These can be strong impediments to women accepting themselves as equal to men. Research is needed to eliminate this situation by identifying intervening variables able to interrupt the limiting effect of childhood socialization experiences. Hopefully, such efforts would reduce the trend of women to internalize notions which negatively influence their feelings of equality with men. The challenges of today's world require the development of the full potential of both sexes.

REFERENCES

1. BEM, S., & BEM, D. Case study of a non-conscious ideology: Training woman to know her place. In D. J. Bem, *Beliefs, Attitudes and Human Affairs* (rev. ed.). Belmont, Calif.: Brooks/Cole, 1971.
2. BERNARD, J. Women and the Public Interest: An Essay on Policy and Protest. Chicago: Aldine-Atherton, 1971.
3. BLOCK, J. H. Conceptions of sex role: Some cross-cultural and longitudinal perspectives. *Amer. Psychol.*, 1973, 28(6), 512-526.
4. CARLSON, R. Understanding women: Implications for personality theory and research. *J. Soc. Iss.*, 1972, 28(2), 17-32.

5. HELSON, R. The changing image of the career woman. *J. Soc. Iss.*, 1972, 28(2), 33-46.
6. KARMAN, F. J. Women: Personal and environmental factors in role identification and career choice. Unpublished Doctoral dissertation, University of California, Los Angeles, 1972.
7. KINCAID, M. Effects of a group consciousness-raising program on the attitudes of adult women. Unpublished Doctoral dissertation, Arizona State University, Tempe, Arizona, 1973.
8. LAWS, J. L. A feminist review of the marital adjustment literature: The rape of the locke. *J. Mar. & Fam.*, 1971, 33(3), 483-516.
9. MAY, R. Sex differences in fantasy patterns. *J. Projective Techn. & Personal. Assess.*, 1966, 30, 576-586.
10. PIRSIG, N. The action on sexism in education. *Amer. Educ.*, 1973, 9(5), 24-26.
11. ROSSI, A. S. Barriers to the career choice of engineering, medicine, or science among American women. In J. Bardwick (Ed.), *Readings on the Counseling of Women*. New York: Harper & Row, 1972. Pp. 72-82.
12. SHERMAN, J. On the Psychology of Women: A Survey of Empirical Studies. Springfield, Ill.: Thomas, 1971.
13. SPENCE, J., & HELMREICH, R. Attitude Toward Women Scale. In *Selected Documents in Psychology*. APA Journal Supplement Abstract Service, APA, Washington, D. C., 1972.
14. WEISSTEIN, N. Psychology constructs the female, or the fantasy life of the male psychologist. In M. Garskof (Ed.), *Roles Women Play: Readings Toward Women's Liberation*. Belmont, Calif. Brooks/Cole, 1971. Pp. 68-83.
15. WESTERVELT, E. A tide in the affairs of women: The psychological impact of feminism on educated women. *Counsel. Psychol.*, 1973, 4(1), 3-26.

3009 West Sierra Vista
Phoenix, Arizona 85017

ON DETERMINING PORNOGRAPHIC MATERIAL*

Yale University and The Ohio State University

JUDITH HOUSTON, SAMUEL HOUSTON, AND E. LAMONTE OHLSON¹

SUMMARY

The Judgment Analysis Technique (JAN) was successfully utilized in capturing both specific and complex policies regarding pornographic material. More specifically, the JAN technique captured 39 out of 59 usable policies in identifying the pornographic material present for three groups of judges (lawyers, policemen, graduate students). The variety of policies present suggests that although the question of what is pornographic is not a simple one with a readily available solution, the JAN technique is probably more effective than any other analysis when investigating the composition of pornographic material.

A. INTRODUCTION AND PROBLEM

For nearly as long as organized society has existed there has prevailed concern and confusion as to what is pornographic or obscene (9). This confusion has greatly increased in the United States in the last decade as a result of the vague and weakly defined decisions handed down by the Supreme Court. Because of these poorly framed decisions it is not surprising that most people, professional and lay, are uncertain as to what constitutes pornography.

When investigating the phenomenon of pornography, one is confronted with the problems of definition, interpretation, and assessment; the effects of pornography on human and societal behavior; and a host of other issues. In fact, it is not uncommon to find incongruities and conflicts in the existing literature regarding these problems. For example, Ware *et al.* (13), Sonenschein (11), and Reed and Reed (10) are of the belief that pornography manifests itself in the cultural, religious, and social preconceived impressions of the viewer of pornography; while such researchers as Brown *et al.* (4)

* Received in the Editorial Office on August 19, 1974 and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ Reprints and a sample of the Pictorial Representations of the pornographic material can be obtained from E. L. Ohlson at the address shown at the end of this article.

and Amoroso *et al.* (1, 2) maintain that pornography manifests itself in the auditory and visual material presented to the viewer of the pornographic material. Still other researchers, such as Englar and Walker (7) and Jakobovits (8), assert that the two concepts do not even coexist. Although conflicts and ambiguities exist in the literature, the question still remains whether pornographic material can be identified; and if so, can it be identified with accuracy. In order to attempt an answer to this question, a methodological refinement is mandated for the examination of the social, psychological, and cultural phenomenon of pornography.

The primary purpose of the present investigation was, therefore, to determine if the policy-capturing methodology known as the Judgment Analysis Technique (JAN) could be adapted for use as a procedure in identifying pornographic material. Such an approach has already been successfully utilized in military and educational research (3, 5). The authors' attempt to use the JAN technique is considered significant in that it represented a first application of this procedure to an area of investigation which appears of concern today.

B. METHOD

1. Sample

The 74 Ss chosen for the investigation were representative of the following areas: (a) 21 lawyers in private legal practice in Greeley, Colorado; (b) 25 police officers from the Greeley, Colorado, Police Department; and (c) 28 doctoral students from the Psychology, Counseling, and Guidance Program at the University of Northern Colorado. These individuals were identified and chosen to participate in the investigation by use of a table of random numbers, and were requested to participate voluntarily as judges of pornography.

2. Instrument

The instrument used to gather the data contained an 11-item profile for each of 100 pictorial representations. The 11 variables are as follows: 1) Appeals to prurient interest. 2) Goes beyond contemporary community standards. 3) Has no redeeming social importance. 4) Involves uncovered adult human genitalia. 5) Displays human sexual intercourse. 6) Displays masturbation. 7) Displays anal intercourse. 8) Displays flagellation or torture. 9) Displays homosexuality. 10) Involves interracial sexual relationships. 11) Displays group sex activity. The reason for using 11 items on each profile and having 100 profiles available for each of the judges stems from

the research conducted by Dudycha (6). More specifically, Dudycha found that it was difficult to cluster judges or raters when fewer than 100 observations existed. Further, Dudycha established that the clustering technique is far more effective when at least 10 predictor or profile items are used.

Each of the 100 profiles was generated by employing a table of random numbers. The table of random numbers was used to insure that the variables would not be systematically correlated; thus the problem of nonorthogonality would be avoided. This technique guaranteed also maximum variability in the distribution of profile descriptors, which is essential for the valid use of JAN.

3. Procedure and Statistical Analysis

The investigators contacted the 74 Ss who were representative of the three groups of judges (doctoral psychology majors, lawyers, and policemen who participated on a voluntary basis). Each of the 74 judges was presented with a set of 100 stimulus profiles descriptive of pictorial pornographic representations. Each judge was requested to rate each of the profiles on a five point scale.

The JAN procedure was applied to the resulting data in order to ascertain the feasibility of the JAN process. (The reader should keep in mind that JAN utilizes a multiple regression approach and a hierarchical grouping technique which clusters raters/judges on the basis of the homogeneity of their raw score regression vectors: i.e., their prediction equations.)

Utilization of the JAN procedure consisted of two basic stages. In the first stage, a least squares solution of a multiple regression equation was computed for each judge, which predicted the criterion decision he had made regarding the content of the pornographic material. Those judges whose R value (multiple R value or predictive efficiency value which is a measure of the judge's intrarater consistency) exceeded .70 were contributing to a consistent policy and were, therefore, included in the JAN analysis.

A hierarchical grouping of those judges who were identified as expressing a consistent pornographic policy (R value in excess of .70) was undertaken in order to determine the number of policies which were present. The investigators inspected the stages of the grouping according to the Ward and Hook (12) recommendation of looking for a break in the objective function. A determination of whether one or more judgmental systems were present among the judges was made by looking for a drop of .05 or more in the R^2 between successive clusters of judges in the JAN process. This particular procedure enabled the investigators to specify the number of policies present.

In order to determine the significance of the unique contribution of each predictor variable (X_1, X_2, \dots, X_{11}) and other specific subsets of variables (i.e., in order to explain the captured policies) the researchers used Ward's (12) multiple linear regression technique.

C. RESULTS

1. *Psychology, Counseling, and Guidance Doctoral Student Judges*

Twenty-six of the 28 judges of the Psychology, Counseling, and Guidance group were used in the analysis. In order to avoid any undue bias of the findings, two of the 26 judges were eliminated because of incomplete response to the pornographic material; and nine of the judges were disqualified because they possessed very specific noncomplex policies regarding pornographic material (i.e., the Ss checked only one column on the profile).

The remaining 17 judges who had expressed complex policies (i.e., the S checked more than one column on the profile) were included in the JAN procedure in order to determine if different policies regarding pornographic material were present. In the resulting JAN analysis nine of the 17 judges had to be eliminated because their multiple R value was less than .7. Their low R value signified that they were not expressing a consistent policy regarding pornographic material.

The R values for the resulting Psychology, Counseling, and Guidance judges who were retained in the final JAN analysis are as follows: Judge 1 ($R = .95$); Judge 2 ($R = .77$); Judge 3 ($R = .87$); Judge 4 ($R = .82$); Judge 5 ($R = .96$); Judge 6 ($R = .76$); Judge 7 ($R = .87$); Judge 8 ($R = .82$).

Table 1 present the stages for the JAN procedure for the group of eight judges and the respective R^2 value associated with each stage. In Stage 1 the eight judges remained ungrouped, and the overall R^2 value for this particular system was .84. The first two judges who were grouped together (Judges 2 and 5) were identified as being exemplary of the most homogeneous policy between any two judges in the system. And, the overall R^2 dropped only .01 in going from Stage 1 to Stage 2. In Stage 6, three separate judgmental groups of judges were formed. Judges 1, 2, 5, 6, 7, 8 formed group one; Judge 3 formed group two; and Judge 4 formed group three.

In reference to Stage 5, the R^2 value dropped .06 from Stage 4. Therefore, in terms of the criteria adapted for this investigation, Stage 4 accords the clustering of judges into five policy systems which are characteristic of the eight judges. That is, Judges 1, 6, and 7 form the first system; Judges 2 and

5, the second system; Judge 3, the third system; Judge 4, the fourth system; and Judge 8, the fifth system.

In order to arrive at a discriminating explanation of the five Psychology, Counseling, and Guidance judgmental policies, a subjective analysis of the predictor variables was formulated. As a result of the subjective analysis the groupings within the hierarchical patterning were identified. The particular unique contribution of the specific subset of variables within these groupings was then tested for statistical significance (see Table 2) in explaining individual policies. The five Psychology, Counseling, and Guidance policies depicted in Table 2 were determined by the following grouping of judges: Policy I—Judges 1, 6, and 7; Policy II—Judges 2 and 5; Policy III—Judge 3; Policy IV—Judge 4; and Policy V—Judge 8.

Those factors considered most important to Judges 1, 6, and 7 (Policy I) in determining and identifying pornographic material were as follows: uncovered human genitalia, displays of anal intercourse, homosexuality, and flagellation or torture. On the other hand Judges 2 and 5 who were grouped around Policy II identified pornographic material as that which constitutes

TABLE 1
STAGES OF THE JUDGMENT ANALYSIS TECHNIQUE PROCEDURE FOR THREE GROUPS
OF JUDGES: GRADUATE STUDENTS, LAWYERS, POLICE OFFICERS

Stage	Judges	R^2	Successive drop in R^2	Collective drop in R^2
<i>Eight graduate student judges</i>				
1	1, 2, 3, 4, 5, 6, 7, 8	.84	—	—
2	1, (2, 5), 3, 4, 6, 7, 8	.83	.01	.01
3	(1, 7), (2, 5), 3, 4, 6, 8	.80	.03	.04
4	(1, 6, 7), (2, 5), 3, 4, 8	.77	.03	.07
5	(1, 2, 5, 6, 7), 3, 4, 8	.71	.06	.13
6	(1, 2, 5, 6, 7, 8), 3, 4	.63	.08	.21
7	(1, 2, 3, 5, 6, 7, 8), 4	.49	.14	.36
8	(1, 2, 3, 4, 5, 6, 7, 8)	.16	.33	.68
<i>Four lawyer judges</i>				
1	1, 2, 3, 4	.82	—	—
2	(1, 4), 2, 3	.77	.05	.05
3	(1, 3, 4), 2	.62	.14	.20
4	(1, 2, 3, 4)	.14	.48	.68
<i>Four police judges</i>				
1	1, 2, 3, 4, 5	.86	—	—
2	1, (2, 4), 3, 5	.83	.03	.03
3	(1, 2, 4), 3, 5	.78	.05	.08
4	(1, 2, 4), (3, 5)	.63	.15	.24
5	(1, 2, 3, 4, 5)	.11	.52	.75

Note: Those judges grouped together within the parentheses were identified as having the most homogeneous policy between any two or more judges in the system.

TABLE 2
FIVE GRADUATE STUDENT JUDGES' POLICY TABLE: *R* VALUES SHOWING UNIQUE CONTRIBUTION OF SPECIFIC VARIABLES TO FIVE JUDGMENTAL POLICIES

Policy Variables	I Judges 1, 6, 7	II Judges 2, 5	III Judge 3	IV Judge 4	V Judge 8
1-3 (impact)	.05*	.51*	.01	.58*	.06*
1	.05*	.00	.01	.01	.00
2	.00	.00	.00	.31*	.01
3	.00	.49*	.00	.31*	.06*
4-11 (content)	.33*	.07*	.72*	.01	.49*
4-6, 10 (natural content)	.03*	.02*	.01	.01	.01
4	.02*	.00	.00	.00	.01
5	.00	.00	.00	.00	.00
6	.01*	.00	.00	.00	.00
10	.00	.01*	.00	.00	.00
7-9, 11 (Unnatural content)	.29*	.04*	.59*	.02	.42*
7	.03*	.02*	.58*	.00	.01
8	.27*	.02*	.00	.01	.42*
11	.00	.00	.00	.00	.00

Note: Description of variables is as follows: 1) Appeals to prurient interest. 2) Goes beyond contemporary community standards. 3) Has no redeeming social importance. 4) Involves uncovered adult human genitalia. 5) Displays human sexual intercourse. 6) Displays masturbation. 7) Displays anal intercourse. 8) Displays flagellation or torture. 9) Displays homosexuality. 10) Involves interracial sexual relationships. 11) Displays group sex activity. The same coding system applies to the variables in Tables 3 and 4.

* Significant beyond the .05 level.

interracial sexual relationships, anal intercourse, flagellation or torture, and that which is of no social redeeming significance. Offering an explanation of this polarized policy is indeed extremely difficult.

The third policy (Policy III), expressed by the Psychology, Counseling, and Guidance doctoral students, was determined by a single judge (Judge 3). Policy III was not concerned with the three impact variables, but rather focused on the natural and unnatural subset variables. That subset variable most significant in identifying pornographic material was Variable 7 (displays anal intercourse). Policy IV was also determined by a single judge (Judge 4), but the policy was concerned with a subset of the impact variables rather than any subset(s) of the content variables. More specifically, Judge 4's policy regarding the identification of pornographic material was that which "goes beyond community standards" and "has no redeeming social importance."

The final and fifth policy which was captured by the JAN procedure was determined by yet another single judge (Judge 8). The policy identified, unlike Policy III and Policy IV, both impact and content variables as important considerations in identifying pornographic material. The specific

variables attended to in this policy included "has no redeeming social importance," and "displays flagellation or torture."

2. Lawyer Judges

Of the 21 Ss of this category, 19 were used in the final analysis. Out of the 19 judges 10 were retained for the JAN procedure as they expressed complex policies. The remaining nine lawyers were not participants as they represented either very specific policies regarding pornography or because their responses were inadequately prepared. In the final JAN analysis six of the 10 lawyers had to be eliminated because their multiple R value was less than .7. The R value for the remaining four lawyer judges are as follows: Judge 1 ($R = .79$); Judge 2 ($R = .75$); Judge 3 ($R = .84$); Judge 4 ($R = .71$). Table 1 depicts the stages for the JAN procedure for the four lawyer judges and the R^2 value associated with each stage. By the criteria adopted by the investigators of this study, there were four different policies expressed by the four lawyer judges as the R^2 drop from Stage 1 to Stage 2 was .0547 which exceeded the .05 criterion.

An explanation of those policies captured by the four lawyers is offered in Table 3. The unique contribution of specific variables in the identification of pornographic material was tested in an attempt to explicate the different policies.

TABLE 3
FOUR LAWYER JUDGES' POLICY TABLE: R VALUES SHOWING UNIQUE CONTRIBUTION
OF SPECIFIC VARIABLES TO FOUR JUDGMENTAL POLICIES

Variable	Policy Judge 1	II Judge 2	III Judge 3	IV Judge 4
1-3 (impact)	.01	.01*	.06*	.26*
1	.00	.03*	.02*	.14*
2	.01	.00	.02*	.13*
3	.00	.19*	.01	.00
4-11 (content)	.61*	.24*	.69*	.17*
4-6, 10 (natural content)	.09*	.08*	.06*	.01
4	.00	.01	.03*	.01
5	.00	.02*	.00	.00
6	.07*	.01	.01	.01
10	.00	.03*	.01	.00
7-9, 11 (unnatural content)	.47*	.17*	.60*	.14*
7	.01	.00	.46*	.01
8	.42*	.16*	.19*	.12*
9	.01	.01	.00	.00
11	.01	.00	.01	.00

Note: See Table 2 for explanation of variables.

* Significant beyond the .05 level.

Judge 1 captured Policy I which focused on the content subset variables and ignored the impact variables. Judge 1's policy regarding pornography identification included the concepts of masturbation, and flagellation or torture. On the other hand, Judge 2 was concerned with both impact and content variables of Policy II. That is, Judge 2's policy on pornography included the concepts of prurient interest, no redeeming social importance, display of human sexual intercourse, interracial sexual relationships, and flagellation or torture. As was true for the aforementioned policies, Policy III was generated by a single judge (Judge 3). For Judge 3, pornographic material included both impact and content variables. More specifically, Judge 3 identified his policy on pornography as appealing to prurient interests, going beyond contemporary community standards, uncovering human genitalia, displaying anal intercourse, and flagellation or torture.

The last policy (Policy IV) captured also involved a single judge (Judge 4) and dealt with both content and impact variables. However, the specific subset variables were different from those identified in Policies I, II, or III. Judge 4 identified pornographic material as that which appeals to prurient interests, goes beyond contemporary community standards, and displays flagellation or torture.

3. Police Judges

Of the 25 Greeley policemen contacted, only 15 had volunteered to participate in the investigation. Of the 15 accepted judges, 10 expressed complex policies regarding the identification of pornographic material and were, therefore, included in the JAN analysis. However, five of the 10 judges had to be eliminated as their multiple R value was less than .7. The R values for those remaining judges are as follows: Judge 1 ($R = .74$); Judge 2 ($R = .89$); Judge 3 ($R = .95$); Judge 4 ($R = .93$); Judge 5 ($R = .82$).

Table 1 depicts the stages for the JAN procedure for the group of five police judges and the R^2 value associated with each stage. There were four different policies present as the R^2 drop from Stage 2 to Stage 3 was .0508 which exceeded the .05 cutoff criterion. Table 4 indicates the four policies captured by the JAN technique in an attempt to identify pornographic material.

Judges 2 and 4 formulated Policy I wherein both content and impact variables were emphasized in the identification of pornographic material. More specifically, those variables referred to were flagellation or torture and no redeeming social importance. Policy II, determined by Judge 1, focused on the content variables while ignoring the impact variables. That is, porno-

TABLE 4
FOUR POLICE JUDGES' POLICY TABLE: R VALUES SHOWING UNIQUE CONTRIBUTION
OF SPECIFIC VARIABLES TO FOUR JUDGMENTAL POLICIES

Variable	Policy I Judges 2, 4	II Judge 1	III Judge 3	IV Judge 5
1-3 (impact)	.13*	.02	.84*	.03*
1	.00	.01	.00	.01
2	.00	.00	.83*	.02*
3	.12*	.00	.00	.01
4-11 (content)	.21*	.50*	.01	.68*
4-6, 10 (natural content)	.01	.06*	.01	.02
4	.01	.00	.00	.02*
5	.00	.00	.00	.00
6	.00	.05*	.00	.00
10	.00	.01	.00	.00
7-9, 11 (Unnatural content)	.20*	.36*	.00	.64*
7	.00	.05*	.00	.37*
8	.18*	.05*	.00	.33*
9	.00	.24*	.00	.00
11	.01	.00	.00	.00

Note: See Table 2 for explanation of variables.

* Significant beyond the .05 level.

graphic material according to Judge 1 and Policy II contained items on masturbation, anal intercourse, flagellation or torture, and homosexuality.

The third policy captured by the police officers was expressed by Judge 3. Although content variables were ignored, emphasis was placed on the impact variables relating to contemporary community standards in terms of identifying pornographic material.

The final policy (Policy IV), expressed by Judge 5, identified both impact and content variables. Specifically, Judge 5 identified pornographic material as that which goes beyond community standards, involves uncovered human genitalia, and displays anal intercourse, flagellation or torture.

D. DISCUSSION AND CONCLUSION

The reader should keep in mind that the Judgment Analysis Technique allows for policy arrangement regarding a particular phenomenon but does not determine if differences exist between groups of judges. As a result, no attempt can be made at this time to explain why each group of Ss identified pornographic material as they did. The reader should also keep in mind that the purpose of the investigation was to field test a technique (the "how") which would successfully capture policies (the "what") regarding the psychosocial phenomenon of pornography.

On the basis of the analyses of the data for the three groups of Ss, the following conclusions can be drawn:

1. The Judgment Analysis Technique was successful in capturing policies regarding the identification of pornographic material for 39 out of 59 judges within the three groups.

2. The Psychology, Counseling, and Guidance student judges clustered together in eight judgmental systems. Although three of the policy systems were specific categorical policies and had to be eliminated, five policies were more complex and could be utilized in identifying pornographic material.

3. The lawyer judges were found to be clustered in seven judgmental systems. Four of the policy systems were able to incorporate complex categorical policies for the identification of pornographic material, while three policy systems were specific and had to be eliminated.

4. The police judges clustered in seven judgmental systems, and four of the seven policies were complex enough to be used in the identification of pornographic material.

5. The lawyer judges, who were more concerned with the impact variables than were the student and police judges, expressed four complex policies in the identification of pornographic material.

6. Of interest was the fact that of the three groups of judges, the student Ss most often identified pornographic material as having no redeeming social importance. To speculate as to why this occurred would be conjecture and beyond the scope of the present investigation.

7. Regardless of the group source, flagellation or torture was seen as that which most often constitutes pornographic materials.

8. Such pornographic material as group sex activity, interracial sexual relations, masturbation, homosexuality, and intercourse were of least importance in the identification process of pornographic material.

Although the process of identifying pornographic material is not a simple one, the JAN technique can be successfully utilized in capturing and explaining different policies regarding the pornographic content of material. Such a process as Judgment Analysis will at least open up a new frontier when psychologist, legal authorities, and government officials attempt to formulate policies regarding "what is pornographic and what is not." The investigators believe, however, that further investigations utilizing the JAN technique are needed. Such studies should involve a greater cross-section of professional and lay peoples, a larger geographic representation, and a greater, more finite variety of pornographic material.

REFERENCES

1. AMOROSO, D. M., & BROWN, M. Problems in studying the effects of erotic material. *J. Sex Res.*, 1973, **9**, 187-195.
2. AMOROSO, D. M., *et al.* The effects of physiological measurement and presence of others on rating of erotic stimuli. *Can. J. Behav. Sci.*, 1972, **4**, 191-203.
3. BOTTENBERG, R. A., & CHRISTAL, R. E. An iterative technique for clustering criteria which retains optimum predictive efficiency. WADD-TN-61-30, ASTIA Document AS-271 615, Personnel Laboratory, Wright Air Development Division, Lackland Air Force Base, Texas, March, 1961.
4. BROWN, M., *et al.* Factors affecting viewing time of pornography. *J. Soc. Psychol.*, 1973, **90**, 125-135.
5. CHRISTAL, R. E. JAN: A technique for analyzing individual and group judgment. FRL-TDR-63-3, ASTIA Document AD-403 813, Lackland Air Force Base, Aerospace Medical Division, February, 1963.
6. DUDYCHA, A. L. A Monte Carlo evaluation of JAN: A technique of capturing and clustering raters' policies. *Organiz. Behav. Hum. Perform.*, 1970, **5**, 501-516.
7. ENGLAR, R. C., & WALKER, C. E. Male and female reactions to erotic literature. *Psychol. Rep.*, 1973, **32**, 481-482.
8. JAKOBOVITS, L. Evaluational reactions to erotic literature. *Psychol. Rep.*, 1965, **16**, 985-994.
9. KRONHAUSEN, E., & KRONHAUSEN, P. Pornography and the Law. New York: Ballantine Books, 1959.
10. REED, J. P., & REED, R. S. Pornography research using direct erotic stimuli. *J. Sex Res.*, 1972, **8**, 237-246.
11. SONENSCHN, D. Dynamics in the uses of erotica. *Adolescence*, 1972, **7**, 233-244.
12. WARD, J. H., & HOOK, M. E. A hierarchical grouping procedure applied to a problem of grouping profiles. Unpublished manuscript (ASD, AFSC, Report No. ASD-TN-61-55). Personnel Laboratory, Lackland Air Force Base, Texas, 1961.
13. WARE, E. E., *et al.* The semantic meaning of pornographic stimuli for college males. *Can. J. Behav. Sci.*, 1972, **4**, 204-209.

Faculty for Exceptional Children
The Ohio State University
356 Arps Hall
1945 North High Street
Columbus, Ohio 43210

THE RELATIVE IMPORTANCE OF THE SUBTESTS OF THE METROPOLITAN READINESS TEST IN THE PREDICTION OF FIRST GRADE READING AND ARITHMETIC ACHIEVEMENT CRITERIA*¹

The Ohio State University

ANN W. ENGIN²

SUMMARY

The regression of five achievement criteria on the six Metropolitan Readiness Test (MRT) subtests was determined for a sample of 100 Ss. The MRT was administered at the end of kindergarten, and the Gates-MacGinitie Reading Test and the arithmetic subtests of the Stanford Achievement Test were administered at the end of first grade. Results indicated that the MRT predicts first grade arithmetic better than it does reading and that Alphabet and Numbers are by far the best predictors among the six subtests of the MRT. A sex difference was present in that girls tended to earn higher scores than boys on the two reading criteria.

A. INTRODUCTION

Readiness tests have proved their worth in the educational enterprise in the prediction of those who will encounter difficulty in the learning tasks required by the schools. Consequently, readiness tests are used in widespread fashion throughout the public schools. One such readiness test whose effectiveness has been well established is the Metropolitan Readiness Test [MRT (7)]. Numerous studies (9, 12, 17, 18) have established the validity of the MRT in the prediction of first grade achievement. The basis for the predictive validity cannot be ascertained readily, however, since total score is generally the single predictor measure. Thus, the MRT is relatively effective for identifying children who are likely to encounter difficulty in reading and

* Received in the Editorial Office on August 20, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ The author wishes to express appreciation to Dr. Jane Wallbrown of Worthington (Ohio) Public Schools (formerly Columbus, Ohio, Public Schools) who provided the data for the present study.

² Requests for reprints should be sent to the author at the address shown at the end of this article.

math performance, but little information is provided regarding differential prediction of reading and mathematics and the analysis of what specific skills constitute important aspects of reading and arithmetic achievement.

The present study was designed to examine the relative importance of the six subtests of the MRT in the prediction of five reading and arithmetic achievement criteria at the first grade level. Based on Underwood's dictum that "the history of science is a history of relentless analysis" (13, p. 271), the study attempts to break down the five achievement criteria into their respective components so that we may obtain a better understanding of these criteria through a more thorough knowledge of their basic relationships.

B. METHOD

1. *Subjects*

The present sample was selected purposively to provide adequate representation of pupils enrolled in inner-, transitional, and outer-city schools of the Columbus (Ohio) public schools. The school classification system was based on the percentage of Ss in a given school receiving Aid for Dependent Children (ADC). The 126 elementary schools were categorized in the following manner: outer-city ($ADC \leq 10\%$), transitional ($ADC = 11-20\%$), inner-city ($ADC > 20\%$). During the 1970-1971 school year there were 35 inner-city 14 transitional, and 77 outer-city elementary schools in the system. Schools were sampled randomly to obtain a sample comprised of three inner-city, two transitional, and three outer-city schools. A specified number of kindergarten children were selected randomly from the schools comprising each of the three strata. The original sample was distributed as follows: outer-city, 50 Ss; transitional, 20 Ss; and inner-city, 50 Ss. Subject attrition between kindergarten and first grade testing was as follows for the respective strata: outer-city, seven Ss; transitional, two Ss; and inner-city, 11 Ss. Consequently, the final sample of 100 Ss was comprised as follows: inner-city, 39 Ss; transitional, 18 Ss; and outer-city, 43 Ss.

The mean Slosson IQ for the 100 Ss (51 girls, 49 boys) included in the final sample was 104.07 with a standard deviation of 16.72. At the time of kindergarten testing the mean chronological age for the sample was 74.22 months with a standard deviation of 4.21 months. The racial composition of the sample consisted of 31 Negro Ss and 69 Caucasian Ss.

2. *Predictor Variables*

Six subtests are included in the Metropolitan Readiness Tests:

(a) *Word Meaning*—The subject must choose from among three pictures

the one depicting the word the examiner names. It is a pictorial vocabulary test.

(b) *Listening*—The subject must choose from among three pictures the one which illustrates the situation the examiner has described briefly. This tests the subject's ability to comprehend more complex language forms (phrases, sentences, and paragraphs).

(c) *Matching*—The subject must mark the one of three pictures which matches a standard. This subtest assesses visual-perceptual matching skills.

(d) *Alphabet*—The subject is asked to choose a letter named by the examiner from among four choices.

(e) *Numbers*—The subject is required to demonstrate comprehension of quantity, size, and general number knowledge.

(f) *Copying*—The subject is required to copy 14 geometric forms. The test assesses the subject's visual perception and motor control.

3. *Criterion Variables*

The Gates-MacGinitie Reading Test (6), Primary A—Form 1 was employed to obtain measures of reading vocabulary and comprehension. The Measures, Problem Solving, and Number Concepts subtests of the Stanford Achievement Test (8), Primary I—Form W were employed to assess arithmetic achievement. The Measures subtest consists of 13 items which measure units commonly included in the first grade curriculum: e.g., distance, money, time, weight, and quantity. The Problem Solving subtest consists of 18 items which measure the ability to understand, remember, and solve story problems presented orally. The Number Concepts subtest consists of 32 items which measure the ability to perform basic arithmetic computations.

4. *Data Collection*

The Metropolitan Readiness Test was administered to small groups of Ss during a time period extending from May 15, 1971 through June 4, 1971. This test was administered in accordance with the directions provided by the authors. All examiners were certificated personnel who had administered the test previously.

The criterion testing was conducted during a 10 day period ranging from June 1, 1972 through June 10, 1972. The Gates-MacGinitie Reading Test and the three arithmetic subtests of the Stanford Achievement Test were administered to small groups of Ss by either a school psychologist or elementary counselor.

5. Data Analysis

The regression of the five achievement criteria on the predictor variables was determined through the use of the Wherry Test Selection (WETSL) program (15). The WETSL program consists of a computerized version of the Wherry-Doolittle method which is a well known forward regression procedure (5). The program provides the following information at each step of the regression procedure: multiple correlation coefficient (R), shrunken multiple correlation coefficient (\bar{R}), F for increment R^2 , standard score (β) coefficients, raw score (b) coefficients, t values for coefficients, and a constant for the raw score equation. The statistic \bar{R} is computed by the Wherry (14) shrinkage formula which estimates the value of R , which might be expected in cross-validation with a similar sample.

The regression procedure was terminated when the increment in R^2 failed to attain significance at the 5% level.

C. RESULTS AND DISCUSSION

The stepwise regression for the achievement criteria is summarized in Table 1, which also contains the final standard score equations for the achievement criteria. The final standard score equations were presented rather than raw score equations, since the discussion concerns the theoretical implications of variables included in the equations, as well as practical matters related to predicting achievement. Analysis of the regression of the achievement criteria on the predictor variables shows that the MRT predicts achievement in arithmetic somewhat better than it does reading (as measured by the Gates-MacGinitie). The final regression equations for Measures, Problem Solving, and Number Concepts yielded R s of .715, .621, and .722 respectively. When shrunken, the obtained R s of .701, .610, and .712 indicated that MRT subtests might be reasonably expected to account for approximately 49%, 37%, and 51% of the respective arithmetic criteria variance in a cross-validation study that employed a similar sample. The final regression equations for Vocabulary and Comprehension yielded R s of .625 and .580. When shrunken, the obtained R s of .598 and .561 indicated that MRT subtests can be reasonably expected to account for approximately 36% and 31% of the reading criteria variance in a cross-validation sample.

An inspection of the separate regression equations for the five achievement criteria on the MRT variables is discussed next so as to reveal the differences and the similarities among the regression equations for the five achievement criteria and between the reading and arithmetic criteria.

1. Reading Criteria

a. Vocabulary Criterion. Examination of the regression of the Vocabulary subtest on the predictor variables indicates that this criterion can be predicted most effectively by a combination of five variables. The five variables selected in order were Alphabet, Numbers, Copying, Sex, and Word Meaning. The vocabulary criterion has its most substantial relationship with the MRT subtest, Alphabet. This indicates that recognition of the letters of the alphabet is the most important skill assessed by the MRT in the prediction of reading vocabulary in the first grade. The next variable to enter the regression equation is Copying, which measures visual-motor perception. Numbers, which assesses general number knowledge, is the third variable to enter the equation. The fourth variable selected was sex which entered the equation with a negative β -coefficient, thus suggesting a tendency for girls to earn higher scores than boys on the vocabulary criterion. The final variable selected was Word Meaning. This subtest is a picture vocabulary test and intuitively should maintain a high relationship to the criterion. Although fifth to enter the regression equation, Word Meaning is somewhat more important in the final regression equation than Sex or Copying.

The five variables included in the regression equation for the vocabulary criterion had an R of .625. An F ratio of 40.065 was obtained for this R ($df = 5, 94$) which indicates that approximately 40% of the variance in the vocabulary criterion is attributable to the five variables. One would, therefore, conclude that the first grade youngster who does well on the vocabulary subtest of the Gates-MacGinitie in first grade possesses good skills in letter recognition, visual-motor perception, number knowledge, and vocabulary at the end of kindergarten. In addition, the youngster is somewhat more likely to be female.

b. Comprehension Criterion. Alphabet is the first variable chosen in the regression equation for Comprehension and constitutes the most effective single predictor for this aspect of first grade reading achievement. Two additional variables resulted in increments in R^2 which attained a high degree of significance. The first of these was Numbers which entered with a positive β -coefficient, and the second was sex which entered with a negative β -coefficient. These coefficients indicated that Numbers tended to improve predictability by adding to the equation, whereas sex functioned to subtract from the equation. The negative β -coefficient for sex suggested a tendency for girls to earn higher scores than boys on the Comprehension Criterion. The three variables included in the regression equation for the comprehension

criterion resulted in an R of .580. An F ratio of 16.22 was obtained for this R which with df 3, 96 indicates that approximately 34% of the variance in the comprehension criterion is attributable to the three variables in the regression equation. Operationally, this means that the child who achieves well in reading comprehension at the first grade level shows the following characteristics at the end of kindergarten: knows the lower case letters of the alphabet, possesses a substantial store of number concepts and related knowledge, and is somewhat more likely to be female.

Both Gates-MacGinitie reading subtests were predicted most effectively by the MRT subtest, Alphabet. One other MRT subtest, Numbers, entered into the regression equation of both reading criteria and is, therefore, an effective predictor of first grade reading achievement as measured by the Gates-MacGinitie. Another significant finding was the negative β -coefficients for sex in both regression equations. The tendency for girls to earn higher scores on both reading criteria adds to the common research finding that girls generally perform better on reading tasks than boys (4). In general, the MRT predicts the reading criteria moderately well, accounting for 40% and 30% respectively of the vocabulary and comprehension criteria.

2. Arithmetic Criteria

a. Measures Criterion. Analysis of the regression of the Measures subtest on the predictor variables summarized in Table 1 indicates that four variables most effectively predict this criterion. The four variables are Copying, Alphabet, Numbers and Matching. The four variables included in the regression equation for the Measures subtest resulted in an R of .715 and explained about 49% of the variance in the criterion. The F ratio for this R was 24.84 which with df 4, 95 attained significance at the .001 level. Thus, the relationship between the Measures subtest and the four predictor variables was not only highly significant but also relatively substantial. Translated into practical terms, the regression equation indicates that those students who are most likely to achieve highest in Measures of the Stanford Achievement Test at the end of first grade were those with high scores on the subtests of the MRT measuring visual-motor perception, recognition of letters of the alphabet, general number knowledge, and visual-perceptual skills related to discriminating word forms. The inclusion of two visual perceptual subtests in the regression equation suggests the importance of visual perceptual maturity in the attainment of concept learning related to measurement. This is an interesting finding which when coupled with theoretical concepts from

the work of Piaget (10, 11) is suggestive of further research into the magnitude and significance of the relationship.

b. Problem Solving Criterion. Examination of the regression of the Problem Solving subtest on the predictor variables indicates that two MRT subtests most effectively predict the criterion: Numbers and Word Meaning. The two variables included in the regression equation resulted in an R of .621. An F ratio of 30.444 was obtained for the R ($df = 2, 97$) and attained significance at the .001 level. The two variables account for approximately 39% of the criterion variance. The R when shrunk resulted in an R of .610. Thus, one might reasonably expect this equation to account for approximately 37% of the criterion variance in a cross-validation study with a similar sample.

c. Number Concepts Criterion. The last arithmetic criterion, Number Concepts, can be predicted most effectively by a combination of three variables: Numbers, Alphabet, and Matching. The three predictor variables resulted in a regression equation with an R of .722, the highest of all R s for the achievement criteria. The R of .722 ($F = 34.845$; $df = 3, 94$) indicates that approximately 51% of the variance in the Number Concepts criterion is attributable to the three variables. Operationally, the first grade student who performs well on the Number Concepts subtest of the Stanford Achievement Test possesses general number knowledge, letter recognition skills, and visual-perceptual matching skills at the end of kindergarten.

Of the three Stanford arithmetic achievement subtests, two were predicted most effectively by the MRT subtest, Numbers. In Measures, Numbers was a significant component, although not the single most effective predictor. Matching appeared in two of the arithmetic regression equations, whereas it did not appear in either of the reading regression equations. Alphabet, the most effective predictor of both reading criteria, appeared in two of the arithmetic regression equations and in both was the second variable to enter the equation.

D. DISCUSSION

The MRT seems to predict first grade achievement in arithmetic (as measured by the Stanford Achievement Test) better than it does reading (as measured by the Gates-MacGinitie). This finding corroborates that of Zingle and Hohol (18) with different criterion measures and tends to suggest the greater complexity of reading as opposed to arithmetic achievement. For the present study, at least, the strength of this assertion must be tempered somewhat by size of the sample which is rather small in relationship to the

ideal sample size for such a study. Thus, the need for further research concerning the relative complexity of reading and arithmetic processes must be clearly acknowledged. The present result in conjunction with those of Zingle and Hohol (18) supports the hypothesis that reading requires a more complex set of skills than arithmetic, but further research is necessary to confirm this hypothesis and to clarify the nature of the skills involved in both areas.

Two other potential limitations of the present study must be acknowledged and discussed. The first concern involves whether significant differences exist among the *Rs* obtained for the five achievement criteria: i.e., are the differences attributable to chance error or do they reflect a true difference. Statistical procedures suitable for testing differences between *Rs* computed for different criteria and based on different combinations of variables are not available (1, 2, 3, 16). Consequently, one is left with only qualitative criteria for evaluating differences in the magnitude of obtained *Rs*. In the present study, the pattern of consistent differences in magnitude between the *Rs* obtained for reading and arithmetic criteria constituted the basis for the inferences discussed above.

The second potential limitation concerns the extent to which the reliability of the criterion measures accounted for the pattern of differences in the magnitude of the *Rs* obtained for the reading and arithmetic criteria. That is, were the *Rs* obtained for the arithmetic criteria higher than the *Rs* obtained for the reading criteria because the former are more reliable than the latter? To examine this possibility, split-half reliability estimates based on odd-even items were computed for the present sample through use of the Spearman-Brown prophecy formula (5, pp. 339-340). The split-half reliability coefficients for the respective achievement criteria were as follows: Vocabulary .969, Comprehension .927, Measures .655, Problem Solving .793, and Number Concepts .934. Thus, it is evident that the higher *Rs* obtained for the arithmetic criteria cannot be explained on the basis of greater reliability for these criteria.

Alphabet and Numbers are by far the best predictors among the six subtests of the MRT. Numbers appears in every one of the regression equations, and Alphabet appears in all except that for Stanford Problem Solving. These subtests are the most closely correlated and appear to contain the most directly taught material (7). This finding tends to suggest that previous learning opportunity and/or experience is the most relevant variable in prediction of first grade achievement.

Also present was the common tendency for girls to earn higher scores on the

two reading criteria, whereas no such like phenomenon or its reverse was present in regard to the arithmetic criteria. This sex difference, best interpreted as due to differential cultural expectations (4), lends additional support to the greater complexity of reading achievement and, consequently, the greater difficulty in the prediction of reading achievement.

REFERENCES

1. ANDERSON, T. W. *An Introduction to Multivariate Statistical Analysis*. New York: Wiley, 1958.
2. DRAPER, N. R., & SMITH, H. *Applied Regression Analysis*. New York: Wiley, 1966.
3. DU BOIS, P. H. *Multivariate Correlational Analysis*. New York: Harper, 1957.
4. DWYER, C. A. Sex differences in reading: An evaluation and a critique of current theories. *Rev. Educ. Res.*, 1973, **43**(4), 455-467.
5. GARRETT, H. *Statistics in Psychology and Education*. New York: McKay, 1966.
6. GATES, A. I., & MACGINITIE, W. H. *Gates-MacGinitie Reading Tests*. New York: Teachers Coll. Press, 1965.
7. HILDRETH, G., GRIFFITHS, N., & MCGAUVAN, M. *Metropolitan Readiness Test*. New York: Harcourt, Brace & World, 1969.
8. KELLEY, T. L., MADDEN, R., GARDNER, E. F., & RUDMAN, H. C. *Stanford Achievement Test*. New York: Harcourt, Brace & World, 1964.
9. MITCHELL, B. Predictive validity of the Metropolitan Readiness Tests and the Murphy-Durrell Reading Readiness Analysis for white and negro pupils. *Educ. & Psychol. Meas.*, 1967, **27**, 1047-1054.
10. PIAGET, J. *The Child's Conception of Number*. New York: Humanities, 1952.
11. ———. *The Origins of Intelligence in Children*. New York: Internat. Univ. Press, 1952.
12. SCOTT, R. Perceptual skills, general intellectual ability, race and later reading achievement. *Reading Teach.*, 1970, **23**, 660-668.
13. UNDERWOOD, B. J. *Psychological Research*. New York: Appleton-Century-Crofts, 1957.
14. WHERRY, R. J. A new formula for predicting the shrinkage of the coefficient of multiple correlation. *Ann. Math. Stat.*, 1931, **2**, 440-451.
15. ———. WETSL program. In R. J. Wherry (Ed.), *Psychology Department Computer Programs*. Columbus, Ohio: Department of Psychology, The Ohio State University, 1969.
16. WILLIAMS, E. J. *Regression Analysis*. New York: Wiley, 1959.
17. ZAESKE, A. The validity of predictive index tests in predicting reading failure at the end of grade one. In W. Durr (Ed.), *Reading Difficulties: Diagnosis, Correction, and Remediation*. Newark, Del.: Internat. Reading Assoc., 1970. Pp. 28-33.
18. ZINGLE, H. W., & HOHOL, A. E. Predictive validity of the Metropolitan Readiness Tests. *Alberta J. Educ. Res.*, 1964, **10**, 99-104.

Faculty for Exceptional Children
The Ohio State University
 356 Arps Hall
 1945 North High Street
 Columbus, Ohio 43210

A RE-EVALUATION OF RAVEN'S STANDARD PROGRESSIVE MATRICES*

Texas Rehabilitation Commission and University of Houston

KEN R. VINCENT AND JOHN A. COX¹

SUMMARY

The utility of Raven's Standard Progressive Matrices (RPM) as a measure of intelligence (*IQ*) was studied. RPM was administered to 380 Vocational Rehabilitation applicants and correlated with selected variables and *IQ* measures. The results indicate that use of RPM 1948 British norms on U. S. Vocational Rehabilitation and general populations is a viable procedure where there is no need for *IQ* accuracy over 120. RPM did show a ceiling of about *IQ* 120. Construct validity was reinforced by correlations of RPM with other standard *IQ* measures. RPM shows the same race effect as is found regularly—the white mean is higher than the black mean—and is related to number of years education.

A. INTRODUCTION

At informal gatherings of American psychologists the authors have noted that RPM is often criticized both as rendering an overestimate of *IQ* and as having a restricted ceiling. That performance on standardized tests of intelligence varies between populations and over time is well documented in psychological literature (5, 6). The initial objectives of the study were to (a) assess the viability of using RPM 1948 British norms on U. S. Vocational Rehabilitation and general adult populations; (b) investigate the assumption that RPM has a restricted ceiling; (c) review the utility of RPM as a measure of *IQ* via correlations with other measures of *IQ*.

As an outgrowth of the ongoing Race-Cultural Bias-*IQ* controversy and the fact that RPM is often touted as a culture fair measure of *IQ* (1), the following additional objectives of the study were added: (d) analyze RPM *IQ*s of the racial subgroups: white (Caucasian), black (Negro), Latin

* Received in the Editorial Office on August 20, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research was supported in part by HEW Social and Rehabilitation Service Grant No. 12-p-5540416-01.

(Mexican-American, which is a combination of Caucasian and Oriental);
(e) compare the correlation of education and RPM IQ.

B. METHOD

1. Sample

The sample ($N = 380$), all of whom had been administered the untimed RPM, was taken from the psychological files of the Texas Rehabilitation Commission's Houston Diagnostic Unit: Project Expedite. Table 1 compares the sample with the general population of the Houston-Harris County area and the U. S. on variables of sex, education, age, and race (11). The present sample compares favorably with both general populations with the exception that blacks are overrepresented. All prospective clients for vocational rehabilitation must have either a physical, emotional, or mental disability. The fact that 15% of the sample had a primary disability of mental retardation (borderline or more severe, -1 SD below the \bar{X}), which approximates the hypothetical 16% general population, further enhances the representative quality of RPM. While the sample was atypical in that all subjects were handicapped previous research has shown RPM to be a viable tool for measuring intelligence in such populations (10).

2. Data Treatment

The most common method of reporting intelligence scores is the deviation IQ. Thus the original RPM age group percentile norms were converted to Wechsler Adult Intelligence Scale (WAIS) deviation IQ estimates [see Hefley (4) adapted from Wechsler (12, p. 19)]. The Madison Academic Computing Center Program D-STAT 2 was used, and computations were made on a Univac 1108.

C. RESULTS AND DISCUSSION

The 1948 British norms on RPM are appropriate for the Vocational Rehabilitation sample population (Sample $\bar{X} = 100.83$, $SD = 16.79$). How-

TABLE 1
REHABILITATION SAMPLE DATA

Population	Sex as %		Education median (years)	Age median (years)	Race as %		
	M	F			White	Black	Latin
Rehabilitation sample	60.0	40.0	12.1	28.7	56.6	35.5	7.4
Houston-Harris County	63.1	36.9	11.8	25.8	69.2	20.1	10.7
U. S.	56.1	43.9	12.1	28.1	83.1	11.7	4.6

Note: The data on sex are based on labor force participation. All other population data are for the general population. Other races not specified are less than 1%.

ever, because blacks were overrepresented in this sample (see Table 1) and there was a significant 14 point difference between black ($\bar{X} = 91.98$) and white ($\bar{X} = 106.01$) performance, the 1948 British norms should be used with caution when making inferences to the general U. S. population, as they may tend to be an overestimate of *IQ*. This difference probably persists throughout the test; a low-level subsample had a WAIS *IQ* of 85 and an RPM *IQ* of 92. Though the sample of Latins was quite small, it is worth noting that their RPM performance was not significantly different from the total sample (see Table 2). The 1948 British norms are probably viable for U. S. populations with large groups of minorities, such as inner-city urban areas, southern U. S., and armed services.

RPM was found to have a restricted ceiling on the present sample and apparently needs several additional items. The total number of items for RPM is 60 which is less than two standard deviations above the sample mean (Raw $\bar{X} = 39.25$, $SD = 12.00$). This difference might be overcome by using Raven's Advanced Progressive Matrices with RPM in a U. S. restandardization. For the present it would probably be more accurate to report a score over 90% as an *IQ* of 120+.

As can be seen on Table 3, RPM correlates reasonably well with the WAIS and less so with other measures of *IQ*. A probable explanation of this is that

TABLE 2
EDUCATIONAL AND RACIAL CORRELATIONS WITH RAVEN'S STANDARD
PROGRESSIVE MATRICES (RPM) AND WECHSLER ADULT
INTELLIGENCE SCALE (WAIS) SCORES

Instrument	N	Education	White	Black	Latin
RPM	380	.36*	.35*	-.39*	.04
WAIS-Total	131	.39*	.31*	-.34*	.07
WAIS-Verbal	131	.40*	.29*	-.29*	.03
WAIS-Performance	131	.34*	.31*	-.36*	.13

* $p < .01$ (.13 for $N = 380$, .23 for $N = 131$).

TABLE 3
RAVEN'S STANDARD PROGRESSIVE MATRICES (RPM) CORRELATIONS
WITH SELECTED MEASURES OF *IQ*

Instrument	N	r
WAIS-Total	131	.85
WAIS-Verbal	131	.84
WAIS-Performance	131	.75
Otis Gamma	97	.70
Revised Beta	58	.38
Quick Test	71	.60

Note: All coefficients significant beyond the .01 level.

paper and pencil *IQ* tests measure fewer intellectual abilities than the multi-ability WAIS. Though all of the paper and pencil tests used in this study correlate reasonably well with the WAIS (1, 2, 9, 13), they apparently are not measuring the same abilities. Also, the present study is limited by the fact that all subjects were not tested on all different *IQ* measures, though all took RPM.

As stated above, on mean RPM *IQ* the white subsample was significantly higher, the black subsample was significantly lower, and the Latin subsample was not significantly different from the total sample (see Table 2). The same was true of performance of racial subgroups on the WAIS (see Table 2).

The 14 point discrepancy between blacks and whites is similar to Jensen's findings on race and intelligence (7, 8). But is RPM truly a culture fair test? RPM is devoid of many factors often cited as limitations of *IQ* testing. It is nonwritten, nonverbal, and nonspeeded. It is also free of nonverbal but culturally based items, such as on the Revised Beta.

Why then is a test composed of ambiguous designs correlated significantly with education, as much so as the WAIS (see Table 2)? One answer is that in a meritocracy all people are fairly equally exposed to education, but that the more intelligent benefit more from the experience (5). There was no significant difference between any of the racial subsamples on years of education (white $r = .07$, $N = 215$, $p > .05$; black $r = -.05$, $N = 135$, $p > .05$; Latin $r = -.05$, $N = 28$, $p > .05$).

While the above is a viable conclusion, an alternate possibility exists. The average RPM *IQ* of the white sample was significantly greater (6 points) than that of the 1948 British sample. The British population was and is almost totally a white population. The education of the U. S. population has increased markedly in the past 26 years (6). While Raven's manual (10) does not include data on the education of his sample, it is reasonable to assume that their education was significantly less than that of the present U. S. population. Consequently the higher RPM performance of the present white sample may be due to an increase in education.

What about the blacks? Few people in the U. S. care to admit the discrepancy between educational systems. This is especially germane to the separate but equal educational system (6) whose primary function may have been to soothe white consciences. It is quite probable that black children cannot read well (along with poor white children) because their teachers cannot read well (3, 6). Nevertheless, in the present study the RPM was found to be influenced by race and education.

REFERENCES

1. ANASTASI, A. *Psychological Testing* (2nd ed.). New York: Macmillan, 1961. Pp. 261-263.
2. CULL, J. G., & COLVIN, C. R. Correlation between the Quick Test (Q. T.) and the WAIS Verbal Scale in the rehabilitation setting. *Psychol. Rep.*, 1970, **27**, 105-106.
3. GEESLIN, R. H., & YORK, P. W. Literacy skills as a barrier to inservice training. *J. Reading Behav.*, 71, **3**, 9-12.
4. HEFLEY, R. Norms for the Raven's Progressive Matrices. Unpublished paper, Texas Rehabilitation Commission, Houston, 1968.
5. HERENSTEIN, R. I. Q. *Atlantic Monthly*, September 1971, 43-64.
6. JENCKS, C. *Inequality*. New York: Basic Books, 1972.
7. JENSEN, A. R. How much can we boost IQ and scholastic achievement? *Harvard Educ. Rev.*, 1969, **39**, 1-123.
8. ———. The differences are real. *Psychol. Today*, December 1973, 80-86.
9. KELLOGG, C. E., & MORTON, N. W. *Revised Beta Examination Manual* (rev. ed.). New York: Psychol. Corp., 1957.
10. RAVEN, J. C. *Guide to the Standard Progressive Matrices* (rev. ed.). London: Lewis, 1960.
11. U. S. DEPARTMENT OF COMMERCE. 1970 Census of the Population. Washington, D. C.: Supt. of Documents, 1970.
12. WECHSLER, D. *WAIS Manual*. New York: Psychol. Corp. 1955.
13. ———. *The Measurement and Appraisal of Adult Intelligence*. Baltimore, Md.: Williams & Wilkins, 1958.

Texas Rehabilitation Commission
5619 Fannin
Houston Texas 77004

SEX PREJUDICE IN JURY SIMULATION*

Department of Sociology, University of Texas at Austin

COOKIE STEPHAN

SUMMARY

This study of 84 male and 101 female college students tested the hypothesis that male and female Ss respond differentially to male and female defendants in a criminal jury trial. Ss read a synopsis of a murder trial in which the defendant was either a man who allegedly murdered his wife or a woman who allegedly murdered her husband. Ss were asked to render verdicts and sentences (if appropriate) either individually or in like-sex groups of three.

There was a significant interaction between sex of S (juror) and sex of defendant in the rendering of the verdicts: Ss were less likely to find a defendant of their own sex guilty than they were to find a defendant of the opposite sex guilty. The possible effect of this finding upon the guarantee of "equal justice under law" was discussed.

A. INTRODUCTION

The issue of sex prejudice in criminal jury trials involves both jurors and defendants. Are the decisions of male and female jurors differentially influenced by male and female defendants? Nagel and Weitzman (10) list five possible outcomes or hypotheses for such influence: (a) men will favor female defendants and women will favor male defendants, (b) men will favor male defendants and women will favor female defendants, (c) both men and women will favor female defendants, (d) both men and women will favor male defendants, (e) men will favor neither sex and women will favor neither sex.

The literature on juries in the United States suggests that many attorneys advocate the first, or opposites-attract, hypothesis. McCart (9, p. 33) states "there is a general impression among lawyers that male jurors, out of gallantry, favor women litigants." Thus attorneys seek an all male jury when there is a women on trial. Karcher (8) concurs: he feels that women are

* Received in the Editorial Office on August 26, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

stricter judges of other women, particularly in criminal cases. Bloomstein (1) notes that women jurors are thought to be harder on their own sex; if a young attractive man is on trial, the attorneys will seek out female jurors.

There is little empirical evidence from real juries. The data, while mixed, favor hypothesis *c*, the female favoritism or paternalism hypothesis. Kalven and Zeisel (7), in their investigation of jury trials in which the judge disagreed with the jury's verdict, determined that a number of sex-related variables—the defendant being a woman, an attractive woman, a mother, a war widow—created sympathy for the defendant such that the jury ruled more leniently than the judge felt was appropriate. Consistent with these data, in grand larceny and felonious assault cases women are more likely to be released on bail, to have their cases dismissed, to be acquitted, and to receive a probated sentence than are men, while in assault cases women are more likely to receive less than one year in prison (10). However, a study of first degree murder cases in the state of California (14) found no differential treatment of defendants based upon sex.

Experimental evidence gathered in a laboratory setting with students as subjects (12) supports the second hypothesis. In this study women favored women and men favored men in sentencing. Social psychological research on liking and similarity showing that people prefer those persons similar to them in attitudes and personality also would suggest support for the second, or likes-attract, hypothesis (2, 3, 11).

In order to test the above five hypotheses in a simulation of a serious criminal trial, a $2 \times 2 \times 2$ factorial study was designed. Male and female Ss (jurors) were asked to render a judgment on the guilt or innocence of a male or female defendant in a murder trial. In addition, data from groups ("juries") of three were contrasted with data from individual "judges."

B. METHODS

1. Subjects

The 185 Ss who participated in the study were enrolled in undergraduate sociology and psychology courses at the University of Texas. Eighty-four of the Ss were male, and 101 were female.

2. Analysis

One-third of the Ss were run individually, and two-thirds were run in groups of three persons. The data for the three Ss in each of the Group Conditions were averaged and then analyzed as individual data. The Ns in the Individual

Conditions are 11 (M subject, F defendant), 13 (M subject, M defendant), 17 (F subject, F defendant), and 18 (F subject, M defendant); the *N*s in the Group Conditions after averaging are 10 (M subject, F defendant), 11 (F subject, F defendant), 10 (M subject, M defendant), and 11 (F subject, M defendant). There are 100 *df* in the analyses.

3. Procedure

Ss were told they would participate in a simulation of a jury trial. They were randomly divided into Group (three person) and Individual (one person) Conditions, with the restriction that all members of a group be of the same sex. Individuals were asked to read a two page synopsis of a murder trial and on the basis of this information to make a decision about the defendant's guilt or innocence, "just as a real judge would do." Group members were asked individually to read the synopsis and then come to a unanimous group decision about the defendant's guilt or innocence, "just as a real jury would do."

The synopsis concerned a murder trial in which one spouse was being tried for killing the other spouse. There were two forms of the synopsis, one in which a wife was on trial for murdering her husband, and one in which a husband was on trial for murdering his wife. The synopsis was identical in every other respect. It contained some personal information about both the husband and wife, a description of a triangle love affair which precipitated the shooting, the sequence of events culminating in the shooting, the prosecution's claim of premeditated murder, and the defense's plea of temporary insanity.

Ss were told they could find the defendant innocent, guilty of manslaughter, guilty of second degree murder, or guilty of first degree murder. The Individuals and Groups finding the defendant guilty were asked to render a sentence.

Ss then were asked to complete a questionnaire form. All Ss were asked to indicate how difficult it was for them individually to come to a decision about the verdict, about perceived certainty of the correctness of the verdict, how difficult it was individually to come to a decision about the sentence, the extent to which the defendant was perceived as a victim or circumstances, the extent to which the defendant was perceived as an evil person, the extent of empathy felt for the defendant, and the degree of felt responsibility for the fate of the defendant (assuming *S* was a real judge in the Individual Conditions, assuming *S* was sitting on a real jury in the Group Conditions).

In addition, Ss in the Group Conditions were asked about the difficulty of

coming to a group decision about the verdict, the perceived certainty of the correctness of the group decision, the difficulty of coming to a group decision about the sentence, questions concerning whether or not the group agreed initially on the verdict and on the sentence, and if not, how the verdict and/or sentence was decided upon, and the *S*'s initial preferences for verdict and sentence.

Finally, the design of the experiment was explained to *Ss*, and they were thanked for their participation.

C. RESULTS

Of the five hypotheses posited above, only the second hypothesis, that male *Ss* will favor the male defendant and that female *Ss* will favor the female defendant, is supported by the data. The three guilty verdicts (murder in the first degree, murder in the second degree, and manslaughter) were combined into one category and contrasted with the not guilty verdict; with use of this measure there is an interaction between sex of *S* and sex of defendant ($F = 3.59, p < .06, 1/93 df$). *Ss* were less likely to find the defendant of their own sex guilty than they were to find the defendant of the opposite sex guilty. If the verdicts are treated as an interval scale, where 1 = first degree murder and 4 = not guilty, there is also an interaction between sex of *S* and sex of defendant. *Ss* convicted the defendant of their own sex of lesser charges than the defendant of the opposite sex ($F = 3.79, p = .05, 1/93 df$). The percentages of "not guilty" verdicts rendered in each experimental condition are listed in Table 1. They range from 36% to 10% for judgments involving *Ss* and defendant of the same sex (female *S*/female defendant, male *S*/male defendant) and from 9% to 0% for judgments involving *Ss* and defendant of a different sex (male *S*/female defendant, female *S*/male defendant). There were no differences by sex of defendant and sex of *S* in number of years the defendant was sentenced to prison ($F = .27, n.s.$).

The paternalism hypothesis, that the female defendant will be treated more leniently than the male defendant, is not supported by the data ($F = .42,$

TABLE 1
PERCENTAGE OF DEFENDANTS FOUND NOT GUILTY
BY EXPERIMENTAL CONDITION AND SEX

Subject (juror)	Defendant in Group Condition		Defendant in Individual Condition	
	Male	Female	Male	Female
Male	10	0	15	9
Female	9	36	6	12

n.s., for guilty/not guilty dichotomy; $F = .02$, n.s., for interval treatment of verdicts). There was no difference in sentencing for the male and female defendant judged guilty ($F = .48$, n.s.). However, the male defendant was judged to be more a victim of circumstances than the female defendant ($F = 4.21$, $p < .05$, $1/93$ df).

A number of differences were found between male and female Ss (jurors). Female Ss found it more difficult to decide upon a sentence than did male Ss ($F = 5.29$, $p < .025$, $1/93$ df). Female Ss reported feeling more empathy for the defendant than did male Ss ($F = 4.74$, $p < .05$, $1/93$ df). Female Ss were more likely to mention that the defendant should receive psychiatric care than were male Ss ($F = 6.56$, $p = .01$, $1/93$ df). They were somewhat less certain of their decision concerning the verdict than were male Ss ($F = 3.26$, $p < .08$, $1/93$ df). Finally, female Ss considered the defendant to be somewhat less evil than did male Ss ($F = 3.10$, $p < .08$, $1/93$ df).

Individuals and groups differed significantly on only one variable. Ss in the Group Condition had a significantly easier time deciding upon the verdict than Ss in the Individual Condition ($F = 6.89$, $p = .01$, $1/93$ df). In addition, there is an interaction between sex of S and Individual-Group Condition. Male Ss rendered longer sentences in the Group Condition than in the Individual Condition. Female Ss rendered longer sentences in the Individual than the Group Condition ($F = 3.79$, $p = .05$, $1/93$ df).

There were several questions asked only of Ss in the Group Condition which pertained to decision-making within the group (jury). Male Ss initially agreed less about the defendant's sentence than did female Ss ($F = 4.33$, $p < .05$, $1/38$ df). However, male Ss found it somewhat easier to come to a decision regarding the verdict than did female Ss ($F = 3.38$, $p < .08$, $1/38$ df). Regardless of the sex of the S, the final sentence of the group was somewhat more lenient toward the male defendant and somewhat less lenient toward the female defendant than were the initial opinions of the individual group members ($F = 3.41$, $p < .07$, $1/38$ df).

D. DISCUSSION

In this study males favored the male defendant and females favored the female defendant in the rendering of the verdict. Paternalism was not a factor in this study. In fact, the data show some support for the reverse hypothesis. The male defendant was thought to be more a victim of circumstances than the female defendant. Further, Groups became somewhat harsher in sentencing the female defendant and somewhat less harsh in sentencing the male defendant. It may be that the crime of murder evokes

a stronger reaction of shock and disapproval when committed by a female defendant rather than by a male defendant because of the extreme disconfirmation of expectations concerning feminine behavior. This finding is consistent with the fact that women are more likely to be jailed for the "masculine" charge of assault, than the more "feminine" charge of larceny (10). The support for hypothesis *b*, like-sex favoritism, is in agreement with the results from the other experimental simulation (12) and with data from civil suits showing that male-dominated juries favor male plaintiffs (10).

How can these within-sex favoritism findings be reconciled with the actual trial data, some of which show support for the hypothesis that females are advantaged in the court system and some of which show no sex discrimination? First, it should be pointed out that the support for the female favoritism hypothesis is weak. The Kalven and Zeisel (7) data deal only with exceptions from the typical jury trial in which the judge and the jury agree upon the verdict. Paternalism of strong enough magnitude to influence the verdict seems to be the exception, rather than the rule. The Nagel and Weitzman (10) data demonstrating female favoritism include all data from the criminal court records examined. Thus, the majority of that data was not collected from jury trials. However, we should ask why there should be any differences, whether of no difference *versus* like-sex discrimination or of paternalism *versus* like-sex discrimination, between actual trial and experimental data. The support for the female favoritism hypothesis, while weak, still is the hypothesis best supported by actual trial data.

One obvious difference between a simulation and an actual courtroom trial lies in the number of decision-makers. In the Rose and Prell (12) study, individual Ss were employed. In the present study, individual Ss and like-sex groups of three rendered verdicts and assessed sentences. It could be hypothesized that an individual's private prejudices are different from those prejudices the individual is willing to express before others. If this suggestion is correct, the Ss in this study reaching decisions in groups of three should have yielded data more similar to that from actual trials than individual Ss. However, Groups and Individuals did not differ significantly from each other in sentencing the defendant, in rendering a verdict, or in rating the defendant on a number of dimensions.

Another obvious difference between the two jury simulations and actual jury trials is that most juries are composed of both men and women, while single Ss or like-sex groups were used in simulation. In the present study, females seemed to make more timid, more uncertain jurors. Females were relatively uncertain of the correctness of their verdict, and they found it relatively

more difficult to decide upon a sentence. And despite the fact that they felt more empathy for the defendant and considered the defendant to be less evil, only in the more frequent mention of psychiatric care for the defendant did these attitudes affect the sentencing or the rendering of the verdict. This nonassertive behavior is consistent with the behavior of the female "jurists" in other laboratory investigations (15, 16). Perhaps in actual jury trials female jurors model this uncertain behavior, causing the male jurors to feel protective toward females, whether juror or defendant. Any unwillingness on the part of the male jurors to show within-sex favoritism in the presence of female jurors could combine with the passive and timid behavior of the female jurors to create a norm of paternalism.

The most critical difference between actual trials and jury simulation lies in the implications of the decision. The simulated juror knows that no real persons will be affected by his decision, while the actual juror is acutely aware of the power of his decision to alter a human's life. We could hypothesize, then, that simulated jurors do not take their task seriously enough to arrive at the decision they would have reached as real jurors. Two somewhat related arguments suggesting the same conclusion are that (a) no simulation can be compelling enough and rich enough in data to allow Ss to make a decision as they would make it in the courtroom and (b) college students employed in simulations make different decisions than does a jury of peers chosen for an actual trial. However, the data from civil suits (10) suggest that the likes-attract hypothesis is more than an artifact of the simulation situation.

One final possibility is that both patterns of discrimination—likes-attract and female favoritism—occur, but that all the variables influencing the patterns of discrimination have not been identified. All that is certain is that the distribution of sex of jurors can have a significant influence upon the fate of the defendant. This relationship should be the subject of further investigation with use of both simulated juries and actual trial data. The law now favors the nonpoor (6, 13) and the Caucasian (4, 5, 13). It is crucial to know if inadvertent sexism of whatever type also is contributing to the inequity that exists in our criminal justice system.

REFERENCES

1. BLOOMSTEIN, M. J. *Verdict: The Jury System*. New York: Dodd, Mead, 1968.
2. BYRNE, D. Interpersonal attraction and attitude similarity. *J. Abn. & Soc. Psychol.*, 1961, **62**, 713-715.
3. BYRNE, D., GRIFFITT, W., & STEFANIAK, D. Attraction and similarity of personality characteristics. *J. Personal. & Soc. Psychol.*, 1967, **5**, 82-90.

4. CROCKETT, G. W., JR. Racism in the courts. *J. Public Law*, 1971, 20, 384-389.
5. HINDELANG, M. J. Equality under the law. *J. Crim. Law Criminol. & Police Sci.*, 1969, 3, 306-313.
6. JONES, M. E. Racism in special courts. *J. Public Law*, 1971, 20, 401-408.
7. KALVEN, J., JR., & ZEISEL, H. *The American Jury*. Boston: Little, Brown, 1966.
8. KARCHER, J. T. The importance of the voir dire. *Practical Lawyer*, 1969, 15, 59-66.
9. MCCART, S. W. *Trial by Jury*. New York: Chilton, 1964.
10. NAGEL, S. S., & WEITZMAN, L. J. Women as litigants. *Hastings Law J.*, 1971, 23, 171-198.
11. NEWCOMB, T. A. The prediction of interpersonal attraction. *Amer. Psychol.*, 1956, 11, 575-586.
12. ROSE, A. M., & PRELL, A. E. Does the punishment fit the crime? A study in social valuation. *Amer. J. Sociol.*, 1955, 61, 247-259.
13. SILVERSTEIN, L. *Defense of the Poor in Criminal Cases in American State Courts*. Chicago: Amer. Bar Foundation, 1965.
14. STANFORD LAW REVIEW. A study of the California penalty jury in first-degree-murder cases. *Stanford Law Rev.*, 1969, 21, 1296-1497.
15. STRODTBECK, F. L., & MANN, R. D. Sex role differentiation in jury deliberations. *Sociometry*, 1956, 19, 3-11.
16. STRODTBECK, F. L., JAMES, R. M., & HAWKINS, C. Social status in jury deliberations. *Amer. Sociolog. Rev.*, 1957, 22, 713-719.

Department of Sociology

University of Texas

Austin, Texas 78712

ATTITUDE SIMILARITY AND LIKING FOR A SUPERVISOR*

Middle Tennessee State University

KATHERINE C. GOOD AND LAWRENCE R. GOOD

SUMMARY

It was hypothesized that a job supervisor who is attitudinally similar to oneself will be evaluated more positively than an attitudinally dissimilar one for fairness in evaluating employees, understanding of people, open-mindedness, judgment in a work situation, personal attractiveness, and desirability as a supervisor. Ss were 46 male and female undergraduates who filled out a 12-item Survey of Attitudes. During a later class period, each S received an attitude survey representing the attitudes and opinions of a hypothetical supervisor who showed either 83% or 17% agreement with each S's own views. S then filled out a Supervisor Judgment Scale for evaluations of the stimulus person. The hypothesized effect of attitude similarity was confirmed for all of the evaluation variables.

A. INTRODUCTION

Byrne (1) found that similarity to a stranger in attitudes and opinions is associated with greater attraction to the stranger (liking and desire to work with him). Evaluations of a stranger's intelligence, knowledge of current events, adjustment, and morality were also found to be influenced by attitude similarity. In a reinforcement-affect model of evaluative responses (2), it was proposed that attitude statements function as reinforcing stimuli evoking an implicit affective response which mediates evaluative responses such as attraction. On the basis of this model of evaluative responses, investigations have been conducted to show that voting preferences (3), hiring decisions (4), and performance evaluations (5) can be significantly influenced by the degree to which an evaluator is attitudinally similar to the stimulus person.

The present study was undertaken to test the hypothesis that one's attraction to a supervisor can be positively influenced by attitude similarity. It was also hypothesized that person-supervisor attitude similarity can affect

* Received in the Editorial Office on August 26, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

the favorability of one's evaluations of a supervisor's fairness in evaluating employees, understanding of people, open-mindedness, and judgment in a work situation.

B. METHOD

Ss were 46 students enrolled in an undergraduate psychology course at Middle Tennessee State University in the spring of 1974. They filled out a 12-item Survey of Attitudes comprising a heterogeneous set of topics, such as men's adjustment to stress and expulsion of demonstrators. Each attitude item was presented as a six-step, agree-disagree scale, as in the following example:

Close Supervision (check one):—I strongly believe that most people will not put in an honest day's work unless they are closely supervised. —I believe that most people will not put in an honest day's work unless they are closely supervised.—I feel that perhaps most people will not put in an honest day's work unless they are closely supervised.—I feel that perhaps most people will put in an honest day's work even if they are not closely supervised.—I believe that most people will put in an honest day's work even if they are not closely supervised.—I strongly believe that most people will put in an honest day's work even if they are not closely supervised.

During class two days later, each *S* received a packet consisting of an instruction sheet, a Survey of Attitudes representing the attitudes of a hypothetical job supervisor, and a Supervisor Judgment Scale. The instructions stated as follows:

Previous studies have shown that an individual can make valid judgments about a stranger just by knowing some of his (or her) attitudes and opinions. In this study, we are interested in whether or not an individual can form an impression of a *hypothetical* person, rather than an actual person.

Each of you has received an attitude survey filled out to show the attitudes and opinions held by a hypothetical supervisor on a variety of issues. Doubtless we could actually find someone who works as a job supervisor who holds these particular attitudes and opinions, but, in this study, we have not actually solicited the attitudes of any supervisors. Instead, we would like for you to study the attitudes and opinions of the hypothetical supervisor you have received and try to form an impression of such a person as a supervisor—assuming the person to be of the same sex as yourself. Then, please fill out the Supervisor Judgment Scale.

The Survey of Attitudes *S* received for the hypothetical supervisor expressed either 83% (10 out of 12) or 17% (two out of 12) similarity with

S's own views and had been filled out by means of the constant-discrepancy technique for manipulating similarity-dissimilarity. The Supervisor Judgment Scale represented a modified version of the Interpersonal Judgment Scale (1) which has been extensively used in attitude-attraction research. It consisted of six seven-point scales on which *S* was to make judgments concerning the degree to which the supervisor would be fair rather than biased in evaluating employees, have a good rather than poor understanding of people, be open-minded rather than close-minded, have good rather than poor judgment in a work situation, be liked by oneself as a person, and be desirable to work for.

C. RESULTS

Table 1 shows the comparison of the similar and dissimilar attitude groups on each of the dependent variables. The hypothesized effect of being similar in attitudes to a supervisor on attraction to the supervisor (like as a person and desire to work for) was confirmed. Attitudinal similarity to the hypothetical supervisor was also associated with the supervisor's being rated significantly higher in fairness in evaluating employees, understanding of people, open-mindedness, and judgment in a work situation.

The results of this study suggest that attitude similarity can influence evaluative responses toward a stranger even when that stranger is identified as being purely hypothetical or imaginary. They also suggest that harmonious supervisor-subordinate relationships can be affected by perceptions of belief-and-opinion congruence. This generalization must remain tentative, of course, until an effect for attitude similarity can be demonstrated in real-life interactions of actual supervisors and those supervised.

TABLE 1
COMPARISON OF THE SIMILAR AND DISSIMILAR ATTITUDE GROUPS

Evaluation variable	Similar (<i>N</i> = 21)		Dissimilar (<i>N</i> = 25)		<i>D</i>	<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
1. Fairness	4.62	1.39	3.56	1.36	1.06	2.52*
2. Understanding of people	4.95	.97	3.52	1.39	1.43	4.09**
3. Open-mindedness	4.91	1.09	3.32	1.55	1.59	4.08**
4. Judgment	5.00	1.18	3.96	1.49	1.04	2.64*
5. Liking	5.38	1.02	3.60	1.41	1.78	4.94**
6. Desire to work for	4.71	1.19	3.08	1.50	1.63	4.26**

* $p < .05$.

** $p < .001$.

REFERENCES

1. BYRNE, D. Interpersonal attraction and attitude similarity. *J. Abn. & Soc. Psychol.*, 1961, **62**, 713-715.
2. BYRNE, D., & CLORE, G. L. A reinforcement model of evaluative responses. *Personal. Internat. J.*, 1970, **1**, 103-128.
3. BYRNE, D., BOND, M. H., & DIAMOND, M. J. Response to political candidates as a function of attitude similarity-dissimilarity. *Hum. Relat.*, 1969, **22**, 251-262.
4. GRIFFITT, W., & JACKSON, T. Influence of information about ability and non-ability on personnel selection decisions. *Psychol. Rep.*, **27**, 959-962.
5. SMITH, R. E., MEADOW, B. L., & SISK, T. K. Attitude similarity, interpersonal attraction, and evaluative social perception. *Psychon. Sci.*, 1970, **18**, 226-227.

Box 493

Middle Tennessee State University

Murfreesboro, Tennessee 37130

AGE AND SEX DISCRIMINATIONS IN FIVE- AND SIX-MONTH-OLD INFANTS*¹

Institute of Nutrition of Central America and Panama

ROBERT E. LASKY, ROBERT E. KLEIN, AND SONIA MARTÍNEZ

SUMMARY

Two experiments investigated the ability of five- and six-month-old Guatemalan infants to discriminate human faces visually and to associate faces and voices differing in age and sex. The 32 infants in Experiment I discriminated between photographs of a man, a woman, and a seven-year-old boy. They did not, however, discriminate between photographs of two men, two women, or of two seven-year-old boys. The 24 infants in Experiment II were presented three different pairs of photographs of faces. One pair consisted of a man and a woman, another of a woman and a child, and the third of a man and a child. Voices appropriate to each pair of photographs accompanied the presentation of the visual stimulus. Looking at the woman and child seemed to be influenced by the presentation of a woman's voice and a boy's voice. Appropriate voices did not alter looking behavior with regard to the woman and man or the man and child.

A. INTRODUCTION

The discrimination of social stimuli in infancy has been actively investigated in the last 15 years. Of particular interest has been the infant's response to the human face (2). In the first few months of the infant's life the feature arrangement of the human face may not be discriminated (5, 6, 9, 12). However, by the third or fourth month, infants can discriminate normal feature arrangement, preferring regular faces to faces with features missing or rearranged (8, 10, 11, 13). A few studies have been concerned with more subtle discriminations, such as the expression of the face (1, 14, 15). Expressions do not seem to be discriminated prior to six months of age. These studies

* Received in the Editorial Office on August 27, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This research was supported by Contract No. PH43-64-640 from the National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, Maryland.

suggest that with age the infant becomes more capable of making finer discriminations of facial stimuli.

The ability to discriminate the sex and age of a person would seem to be of importance to the infant. Fagan (4) has demonstrated that the five- to six-month-old infant can discriminate between photographs and masks of men, women, and infants. In addition, under some circumstances female infants of this age may be able to distinguish between photographs of two different men or of two different women. Four-month-olds could not make these discriminations. On the other hand, Fitzgerald (7) has shown that the pupils of four-month-olds dilate significantly more to a strange female than to their mothers.

The major purpose of the present investigation was to determine whether five- and six-month-old infants differentially discriminate photographs of adult males, adult females, and male children. Experiment I of the present study was designed to determine whether infants are capable of making sex discriminations before age discriminations or *vice versa*. Both discriminations would seem to be important, since different interactions and expectations are associated with people of different sexes and ages. A technique developed by Fagan (3) was used to test the infant's visual discrimination of faces differing in age and sex. Fagan's discrimination technique is based on the fact that infants become habituated to familiar stimuli and prefer to look at novel ones. A demonstrated preference for one stimulus rather than another is evidence for discrimination. Fagan's technique is more appropriate than a simple preference test, since it offers the possibility of demonstrating that the infant can discriminate stimuli which are equated for initial attractiveness.

Experiment II of the present investigation attempted to explore whether six-month-old infants associate age-sex appropriate voices with their respective faces. Such an association would indicate that five- and six-month-old infants do have different expectations of people of different sexes and ages.

B. METHOD

1. Subjects

The subjects were recruited from government-sponsored medical clinics located in lower middle class neighborhoods of Guatemala City, Guatemala. The subjects met the following predetermined criteria for social class, birth history, and health: (a) Both parents of the Ss were from the lower middle class; (b) The subjects had normal deliveries and weighed at least 2.5 kg at birth; (c) The subjects had no major health problems. The sample con-

sisted of subjects that met these criteria and were not more than seven nor less than five months of age (mean age = five months 26.1 days, $SD = 15.5$ days). The entire sample consisted of 56 infants (28 males and 28 females). Thirty-two infants served in Experiment I, and 24 infants served in Experiment II.

2. Materials

A visual preference apparatus similar to the one developed by Fantz (6) was used to present the stimuli to the Ss. The Ss were seated 64 cm from a presentation stage 40×40 cm in size. Stimuli could be positioned in the stage for presentation. The experimenter sat behind the stimuli opposite the subject and recorded the fixations of the subject through a $1/4$ inch hole located in the center of each stimulus sheet. The experimenter did not know which stimuli were being presented. Fixations of the right and left halves of the stimuli were recorded on separate channels of a polygraph. A panel was placed between the infant and the stimulus when changes in the stimuli were made.

The stimuli for Experiment I consisted of life-size achromatic photographs of Latin men, women, and seven-year-old boys. None of the people photographed wore glasses. Their faces were expressionless in the photographs. The women had long hair, while the men and boys did not. Each 43×43 cm white cardboard sheet had two photographs mounted symmetrically, one on the right hand side and one on the left.

The stimuli for Experiment II were identical with those used in Experiment I. However, only three visual discrimination problems were used in Experiment II: a man *versus* a woman, a man *versus* a seven-year-old boy, and a woman *versus* a seven-year-old boy. Each visual discrimination problem was accompanied by tape recordings of the two voices belonging to the people in the photograph. The voices repeated the Spanish phrase "¿Dónde está tu mamá?" ("Where is your mother?") with normal inflection and a regular rhythm, once every 2.5 seconds. One voice repeated this phrase for two minutes, after which the second voice repeated the phrase for another two minutes. There was no break in the rhythm between the first and the second voices.

3. Procedure

a. Experiment I. The 32 subjects in Experiment I were randomly assigned to one of four groups (Groups I-IV) with four males and four females in each group. Each group was presented a different set of three discrimination problems. Each discrimination problem consisted of an initial 30 second

presentation of two identical photographs, one on the left and one on the right of the stimulus sheet. This stimulus was termed the standard. A panel was then slid in front of the stimulus to occlude it from the infant's view. The standard was replaced by a test stimulus. The test stimulus consisted of two photographs, one of which was identical to the photographs in the standard, and the second of which was novel. The test stimulus was presented 15 seconds after the standard had been presented and was presented for 10 seconds.

Table 1 describes the stimuli presented to each group of subjects. This design permitted an assessment of six different discriminations: the discriminations between (a) an adult male and an adult female, (b) an adult female and a seven-year-old male, (c) an adult male and a seven-year-old male, (d) two adult males, (e) two adult females, and (f) two seven-year-old males. Sex of the subjects, left-right position of the novel test stimulus, and which of the two test stimuli was novel were completely counterbalanced.

b. *Experiment II.* The 24 subjects in Experiment II were randomly assigned to one of three groups (Groups V-VII) with four males and four females in each group. Each of the three groups was presented a different discrimination problem which lasted for four minutes. The visual stimulus remained the same throughout the four minutes. However, for the first two minutes one voice was heard, and for the second two minutes the second voice was heard. The design was counterbalanced by means of subgroups for position of the visual stimuli, order of the voices, and sex of the subjects. The design is presented in Table 2.

C. RESULTS

1. *Experiment I*

The total time subjects fixated the novel and familiar test stimuli in Experiment I was computed. The fixation time of the familiar test stimulus

TABLE 1
STIMULI PRESENTED IN EXPERIMENT I

Group	Discrimination test stimuli					
	Problem 1		Problem 2		Problem 3	
	Familiar	Novel	Familiar	Novel	Familiar	Novel
I	Child ₁	Woman ₃	Child ₂	Child ₃	Child ₄	Man ₂
II	Woman ₃	Child ₁	Woman ₁	Woman ₂	Woman ₄	Man ₁
III	Man ₁	Woman ₄	Man ₃	Man ₄	Man ₂	Child ₄
IV	Woman ₂	Woman ₁	Child ₃	Child ₂	Man ₄	Man ₃

Note: The subscripts refer to individual photographs.

TABLE 2
STIMULI PRESENTED IN EXPERIMENT II

Group and subgroup ^a	Visual stimuli		Verbal stimuli	
	Left	Right	First	Second
V	a.	Woman	Child	Woman
	b.	Woman	Child	Child
	c.	Child	Woman	Woman
	d.	Child	Woman	Child
VI	a.	Man	Man	Man
	b.	Man	Man	Woman
	c.	Woman	Woman	Man
	d.	Woman	Man	Woman
VII	a.	Child	Man	Child
	b.	Child	Child	Man
	c.	Man	Man	Child
	d.	Man	Child	Man

^a One male and one female infant were placed into each of these subgroups within Groups V, VI, and VII.

was subtracted from the fixation time of the novel test stimulus. If subjects could discriminate a pair of test stimuli, the difference score should be consistently positive. The mean difference scores observed for each group of male and female subjects are shown in Table 3.

Sex differences were not apparent. For each of the six different discrimination problems the observed difference scores were ranked, and Mann-Whitney *U* tests were calculated to determine whether there were sex differences in the discrimination of the stimuli. No sex differences proved significant at the .10 level.

t tests were computed to determine whether the difference scores observed for each different discrimination problem were significantly greater than zero. Males and females were combined for this analysis. The subjects significantly

TABLE 3
MEAN DIFFERENCE SCORES FOR THE SIX DISCRIMINATION PROBLEMS IN EXPERIMENT I

Discrimination problem	Male	Subjects Female	Total
Woman <i>vs.</i> child	3.1	1.8	2.4
Woman <i>vs.</i> man	2.9	2.1	2.5
Man <i>vs.</i> child	1.7	.9	1.3
Man <i>vs.</i> man	.8	.5	.6
Child <i>vs.</i> child	1.8	-1.6	.1
Woman <i>vs.</i> woman	-.3	-.1	-.2

Note: Scores represent the mean difference between the number of seconds of fixation of the novel and the familiar stimuli. A positive score indicates that the subject spent more time fixating the novel than the familiar stimulus.

discriminated the differences between a photograph of a man and a woman ($t = 2.76$, $df = 15$, $p < .01$) and between a woman and a seven-year-old male ($t = 2.27$, $df = 15$, $p = .025$). The discrimination between a man and a seven-year-old male approached significance ($t = 1.67$, $df = 15$, $p = .06$). The discriminations between two men ($t = .821$, $df = 15$), between two women ($t = -.223$, $df = 15$), or between two seven-year-old males ($t = .122$, $df = 15$) failed to reach significance at the .10 level.

2. Experiment II

The mean number of seconds each stimulus was fixated by subjects in Experiment II during the presentation of the appropriate and inappropriate voices was calculated. The adult male photograph was fixated significantly more often than the adult female photograph. In addition, significantly more visual fixations were recorded in the first two minutes in contrast to the last two minutes of the experimental session ($t = 3.26$, $df = 23$, $p < .01$). This result suggests that subjects were habituating to the visual stimuli during the course of the experiment.

Both the differential attractiveness of the stimuli and habituation must be controlled for in testing whether subjects looked more at faces when the appropriate voice was simultaneously presented. Consequently, the first 20 seconds during which each of the two different voices were presented were considered. During each of these two 20 second periods the percentage of total fixation time that was spent fixating each photograph was computed. Table 4 presents the percentage of total fixation time for each photograph

TABLE 4
PERCENTAGE OF FIXATION TIME AS A FUNCTION OF APPROPRIATE AND
INAPPROPRIATE VOICES IN EXPERIMENT II

<i>Group V: Woman vs. child</i>	
% of time fixating woman during woman's voice 55.7	% of time fixating woman during child's voice 35.2
<i>Group VI: Woman vs. man</i>	
% of time fixating woman during woman's voice 33.6	% of time fixating woman during man's voice 27.6
<i>Group VII: Man vs. child</i>	
% of time fixating man during man's voice 57.4	% of time fixating man during child's voice 56.0

Note: For each group the remaining percentage of fixation time was spent fixating the photograph of the second stimulus in the presence of appropriate and inappropriate voices.

in the presence of the appropriate and inappropriate voices. The difference in the percentage of time fixating a face as a function of the appropriateness of the voice was also computed. The appropriate voices were associated with significantly more looking at the corresponding faces only in Group V (Wilcoxon matched-pairs signed-ranks test, $T = 4$, $N = 8$, $p = .025$). Subjects in this group were presented with the voice and face of the adult female and the voice and face of the seven-year-old boy. Significant differences in fixation were not observed in either of the other two groups. However, the observed difference between Group V and the other two groups failed to reach significance ($F = .603$, $df = 2/27$).

D. DISCUSSION

The results from Experiment I indicate that five- to six-month-old Guatemalan infants can discriminate between photographs of a Latin man, woman, and seven-year-old boy. However, these infants were unable to differentiate between photographs of two men, of two women, or of two seven-year-old boys. No sex differences in discriminative capacity were observed. Little evidence was found to support the hypothesis that infants differentiate people by sex prior to age or *vice versa*. A replication with younger infants, perhaps between four and five months of age, may indicate whether there are developmental differences in the discrimination of the age and the sex of people.

These results are compatible with those reported by Fagan (4) with infants of similar ages in the United States. However, Fagan did report that male infants in the U.S. failed to discriminate some social stimuli which female infants could discriminate. Similar sex differences were not observed in this group of Guatemalan infants. Social stimuli would seem to be particularly useful in cross-cultural studies of cognitive development, since they are among the few stimuli that all infants have had experience with.

In Experiment II differential visual regard of facial stimuli as a function of the appropriateness of voices simultaneously presented was observed only when an adult female and a seven-year-old boy were compared. Differential visual regard was not observed for either an adult female or for a seven-year-old boy in the presence of an adult male. Experiment I demonstrated that infants of this age can make these visual discriminations, and consequently the lack of differential visual regard cannot be attributed to a failure to discriminate these stimuli visually. More work remains to define the developmental course of the association of age-sex appropriate voices with faces.

REFERENCES

1. AHRENS, R. Beitrag zur Entwicklung des Physiognomie und Mimikerkennesns. *Zeits. fur Exper. & Angewandte Psychol.*, 1954, **2**, 412-454, 599-633.
2. BOND, E. K. Perception of form by the human infant. *Psychol. Bull.*, 1972, **77**, 225-245.
3. FAGAN, J. F. Memory in the infant. *J. Exper. Child. Psychol.*, 1970, **9**, 217-226.
4. ———. Infant's recognition memory for faces. *J. Exper. Child Psychol.*, 1972, **14**, 453-476.
5. FANTZ, R. Visual perception and experience in early infancy: A look at the hidden side of behavior development. In H. W. Stevenson, E. H. Hess, & H. Rheingold (Eds.), *Early Behavior*. New York: Wiley, 1967.
6. FANTZ, R., & NEVIS, S. Pattern preference and perceptual-cognitive development. *Merrill-Palmer Quart.*, 1967, **13**, 77-108.
7. FITZGERALD, H. E. Autonomic pupillary reflex activity during early infancy and its relation to social and non-social visual stimuli. *J. Exper. Child Psychol.*, 1968, **6**, 470-482.
8. HAAF, R. A., & BELL, R. Q. A facial dimension in visual discrimination by human infants. *Child Devel.*, 1967, **38**, 893-899.
9. HERSHENSON, M., KESSEN, W., & MUNSINGER, H. Ocular orientation in the human infant: A close look at some positive and negative results. In W. Wathen-Dunn (Ed.), *Models for the Perception of Speech and Visual Form*. Cambridge: M.I.T. Press, 1967. Pp. 282-290.
10. KAGAN, J. The growth of the "face" schema: Theoretical significance and methodological issues. In J. Hellmuth (Ed.), *Exceptional Infant: Vol. 1. The Normal Infant*. Seattle, Wash.: Special Child Publ., 1967.
11. KAGAN, J., HENKER, B. A., HEN TOV, A., LEVINE, J., & LEWIS, M. Infants' differential reactions to familiar and distorted faces. *Child Devel.*, 1966, **37**, 519-532.
12. KOOPMAN, R. R., & AMES, E. W. Infants' preferences for facial arrangements: A failure to replicate. *Child Devel.*, 1968, **39**, 481-495.
13. LEWIS, M. Infants' responses to facial stimuli during the first year of life. *Devel. Psychol.*, 1969, **1**, 75-86.
14. SPITZ, R. A., & WOLF, K. M. The smiling response: A contribution to the ontogenesis of social relations. *Genet. Psychol. Monog.*, 1946, **34**, 57-125.
15. WILCOX, B. M., & CLAYTON, F. L. Infant visual fixation on motion pictures of the human face. *J. Exper. Psychol.*, 1968, **6**, 23-32.

INCAP

Apartado Postal 1188

Guatemala, C. A.

EFFECTS OF AFFECTIVE EXPRESSION ON DIVERGENT THINKING PRODUCTION*

Eastern Michigan University

MARIE DELLAS

SUMMARY

The effects of affective expression on divergent thinking performance were studied in 40 male and female graduate education students. Divergent thinking was operationally defined in terms of the ideational fluency and originality dimensions of Guilford's (4) Plot Titles test. Experimental group E1, in which emotional states were related to visual stimuli, produced significantly more original responses than experimental group E2 ($p < .025$), in which the same visual patterns viewed in terms of their geometrical-technical dimensions, and control group C1 ($p < .01$), in which no training was administered. Groups E2 and C1 demonstrated no significant differences. The groups did not differ with respect to ideational fluency. Verbal ability was a poor predictor of individual differences in ideational fluency and originality. The results suggest an effective approach toward fostering originality and indicate that nonintellective variables may be significant in the creative process.

A. INTRODUCTION

A significant issue in creativity research concerns the identification of effective methods for facilitating creative production. Some of the procedures typically used to foster this behavior include Osborn's (9) principles for self-questioning which stimulate many different possible solutions to various problem situations; his "brainstorming" technique, a group association procedure which requires the rapid production of ideas to problem situations with judgment of their value deferred to avoid inhibition of ideas; and Maltzman's (6) free association technique which requires a different associative response to each repeated presentation of word stimuli. Generally, these procedures attempt to effect an increase in the number of responses and,

* Received in the Editorial Office on August 29, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

thereby, increase the probability of the occurrence of unusual or uncommon responses.

The purpose of the present study was to determine whether creative production, defined in terms of Guilford's (4) ideational fluency and originality dimensions of divergent thinking, could be facilitated by the procedure based on a distinguishing characteristic of the creative individual—his tendency to integrate elements from two disparate psychological entities: specifically, visual experiences and emotional states.

On the basis of responses to the Rorschach, Hersch (5) found that recognized creative persons, as compared with noncreative normals and schizophrenics, gave many more responses in which the visual was perceived as having emotional qualities or the attributes of living things. Walker (13) reported that high-creative rated mathematicians and chemists had more responses of this type on the Physiognomic Cue Test which represents a series of schematic line figures. Similarly, using various line drawings, Wallach and Kogan (16) found responses involving the attribution of affective qualities to be maximal in fifth grade students who scored high on the investigators' measures of creativity and intelligence, and minimal in students low in both these factors. Those findings indicate an affective style of cognitive functioning—a sensitivity to and conceptualization of emotion—that may be instrumental in creative production. It seems reasonable to assume, therefore, that fostering this association of emotional experiences with visual stimuli would facilitate creative performance.

To explore this hypothesis, a research study was designed in which subjects were exposed to two different conditions: one in which visual patterns were treated as analogues or representations of emotional experiences, the other in which these same visual patterns were viewed in terms of their physical or geometrical-technical properties (the latter condition attempting to reduce or eliminate any association with affective states). A third control group which did not undergo any treatment was also included. Given the cited evidence, it was hypothesized that subjects trained to associate visual experiences and emotional states would perform significantly better with respect to ideational fluency and originality on a divergent thinking task.

B. METHOD

1. *Subjects*

The subjects ($N = 107$), ranging in age from 21 to 43, were graduate education students enrolled in the summer session educational psychology

courses of a midwestern university. The classes were randomly selected and randomly assigned to experimental and control conditions.

2. *Instruments*

Creativity was operationally defined in terms of the fluency and originality dimensions of divergent thinking and assessed by the Guilford (4) Plot Titles test which requires subjects to supply as many appropriate titles as they can to two short stories in the time allotted. Two scores were obtained: an ideational fluency measure based on low quality, nonclever titles, and an originality measure based on high quality, clever titles. The test was scored according to test manual instructions and rated by two persons. Interrater reliabilities obtained from a random sample of 50 tests were as follows: ideational fluency .98, and originality .90.

Since intelligence has been shown to have a low, positive correlation with divergent thinking (1, 7), the GT Vocabulary Test (12) was administered as a measure of intelligence in order to explore the relationship of this measure to other variables, and to determine whether differences in verbal ability could account for differences in outcomes of the study.

3. *Treatment and Procedure*

The visual stimuli obtained from the Sarbin (10) and the Sarbin and Hardyck (11) studies were line drawings of human stick figures in various postures with faces that were open circles. A booklet of 22 human stick figures was given to each subject in the experimental conditions. Instructions and examples of the responses to be given were on the first page. These were read aloud by the experimenter as the subjects simultaneously read them silently. Instructions for the group (E1) attributing affect to the stimuli requested that they describe each figure with respect to (a) his/her emotional states (the feelings the figure portrayed), and (b) what he/she was doing (the context of the feeling of emotion). Examples: "He's tiptoeing away from something wrong he just did. He's scared and worried." "She feels proud and happy—just finished her first modeling job." Instructions for the group (E2) describing the physical or geometrical-technical aspects of the figures requested that they describe each figure with respect to its physical appearance only. Examples: "Man sitting, legs bent, arms about legs." "This person has one hand on hip, the other is raised, right leg is ahead of left leg." The experimental sessions did not exceed 45 minutes; however, there were no time restrictions.

The experimental treatments occurred during regular class periods and

were immediately followed by the administration of the divergent thinking test. During the experimental sessions of the E1 and E2 groups, the control group (C1) was engaged in its regular class activities, and the divergent thinking test was administered at the end of the period. Standard instructions, as specified in the test manual, were used for all groups. The GT Vocabulary Test was administered during a regular class period to all groups approximately two weeks after the experimental and testing sessions.

C. RESULTS AND DISCUSSION

Table 1 shows the descriptive data of the measures for the experimental and control groups. A univariate F test of the ideational fluency scores disclosed no significant difference among the means of the three groups ($F = 1.01$, $df = 2/104$, n. s.). Apparently, the treatments had little or no impact on this production. Similar analyses of the originality scores, however, revealed that the mean of group E1 differed significantly from those of group E2 ($F = 5.29$, $df = 1/72$, $p < .025$) and group C1 ($F = 8.27$, $df = 1/71$, $p < .01$). The mean difference between groups E2 and C1 was nonsignificant ($F = 3.35$, $df = 1/65$, n. s.). On the basis of this finding, the originality scores of these two groups were combined and compared with those of group E1. This analysis yielded an F of 10.55 ($df = 1/105$, $p < .01$),¹ indicating that subjects who associated visual stimuli with emotional states produced significantly more original responses than those who associated geometrical-technical characteristics and those exposed to no treatment at all. Inasmuch as the socialization process of our culture is characterized by an emphasis

¹ While group E1 and the combined group E2 and C1 demonstrated unequal variances, according to Winer (19), the experimenter need not be concerned with only some departure from the hypothesis of equal population variances. Nevertheless, a t test which does not assume equal variances in a large sample (14) was also conducted between group E1 and combined group E2 and C1 with a resultant t of 1.74 ($p < .05$, one-tailed test).

TABLE 1
MEANS AND STANDARD DEVIATIONS OF ORIGINALITY, IDEATIONAL FLUENCY, AND
VOCABULARY SCORES FOR EXPERIMENTAL (E), CONTROL (C),
AND COMBINED CONTROL GROUPS

Variable	E1 ($N = 40$)		E2 ($N = 34$)		C1 ($N = 33$)		E2 & C1 ($N = 67$)	
	M	SD	M	SD	M	SD	M	SD
Originality	2.63	2.38	1.50	1.71	1.27	1.39	1.39	1.56
Ideational fluency	10.98	4.03	10.53	5.18	9.55	3.62	10.04	4.45
Vocabulary	25.90	3.87	25.41	5.02	25.24	5.11	25.33	4.99

on viewing stimuli and experiences in terms of their geometrical-technical attributes (18), then one might hypothesize that the subjects in groups E2 and C1 approached the task with a similar orientation, one that does not serve the originality function.

While the differential effects of the experimental treatment support the hypothesized multidimensionality of divergent thinking (4), they also indicate that experiences particularly relevant to the dynamics of each component are required for its facilitation. The higher originality mean of the E1 group suggests that associating emotional states with visual stimuli may relate uniquely to the dynamics of the originality dimension of divergent thinking, affecting the quality rather than the quantity of responses. The specific factors involved in the facilitation of the originality component have not, of course, been determined in the present study. However, the nature of the treatment suggests that affect or emotion may be a significant variable. The subjects were specifically integrating or bringing into continuity experiences concerning emotional states. Either they recollected former emotional states that they had experienced and that corresponded to the visual patterns presented, or they relived those states which then became fused with the visual stimuli (8). This increased sensitivity to emotions may have brought into awareness diverse experiences, affectively linked, thus increasing the availability of sources for uncommon responses. Conceivably, the treatment may also have resulted in a change of attitude or reduction of inhibition with the concomitant release of relatively immature or primitive thinking, a condition considered important in the creative process (1, 17), which was adapted toward the achievement of the original responses. The significance of affect or emotion in original production was also demonstrated in a recent study by Gerber (3). He reported a significant positive correlation between originality and the Affect-Cognition Scale which seems to tap a process involving the degree of conceptualization and differentiation of emotional information.

Table 2 shows the intercorrelations among the variables in the different groups. According to the present data, the verbal ability measure administered to assess intelligence (GT Vocabulary Test) seems to be a poor predictor of individual differences in originality and ideational fluency. It demonstrated no correlation with ideational fluency in any of the groups, a finding that supports Wallach's (15) contention of the relative independence of intelligence measures and ideational fluency. While the correlation between verbal ability and originality scores in the combined E2 and C1 group was significant, it accounted for little of the variance in originality (11%), indicating

TABLE 2
INTERCORRELATIONS AMONG THREE VARIABLES FOR EXPERIMENTAL (E),
COMBINED CONTROL, AND TOTAL GROUPS

Variable	E1 (<i>N</i> = 40)		E2 & C1 (<i>N</i> = 67)		E1, E2, C1 (<i>N</i> = 107)	
	Ideational fluency	Vocabulary	Ideational fluency	Vocabulary	Ideational fluency	Vocabulary
Originality	— .24	.12	— .16	.33**	— .15	.24*
Ideational fluency		— .13		— .02		— .05

* $p < .05$, two-tailed test.

** $p < .01$, two-tailed test.

that original productivity was largely dependent on other variables. The negligible correlation (.12) evidenced in group E1 suggests that factors other than verbal ability were brought into play with respect to originality as a result of the treatment.

The data also demonstrated a significant difference in the variance of the originality scores between group E1 and the combined E2 and C1 group ($F = 2.34$, $df = 39/66$, $p < .01$), suggesting that the treatment effect was not uniform across subjects and that individual differences interacted with the treatment. A question arises, therefore, pertaining to those persons who would profit more from this treatment than others: What are the personality characteristics that predict greater benefit from this particular treatment? The fact that verbal ability did not relate to performance suggests that it is not likely to be the factor that interacted with the treatment. Since the effective treatment, however, involved the expression of affect or emotion, and defensiveness serves to deny or avoid this condition, defensiveness may be suggested as a promising factor for future research.

The findings of the present study, which has demonstrated that relating emotional experiences to visual stimuli facilitates the production of original responses, suggest that nonintellective variables—in this case, emotions—may be significant in the creative process. A review of the literature concerning characteristics of creative persons (2) indicates that these individuals are distinguished more by nonintellective traits rather than intellectual abilities. Perhaps research conducted within the framework of affective traits or components may hold promise for more valid findings concerning creative potential and the creative process.

REFERENCES

1. BARRON, F. *Creativity and Psychological Health: Origins of Personality and Creative Freedom*. Princeton, N. J.: Van Nostrand, 1963.

2. DELLAS, M., & GAIER, E. L. Identification of creativity: The individual. *Psychol. Bull.*, 1970, **73**(1), 55-73.
3. GERBER, L. A. Measurement of statements made about emotion: An investigation of the Affect-Cognition scale. *Psychol. Rep.*, 1972, **30**, 231-235.
4. GUILFORD, J. P. *The Nature of Human Intelligence*. New York: McGraw-Hill, 1967.
5. HERSCH, G. The cognitive functioning of the creative person: A developmental analysis. *J. Project. Techn.*, 1962, **26**, 193-200.
6. MALTZMAN, I. On the training of originality. *Psychol. Rev.*, 1960, **67**, 229-242.
7. MCNEMAR, Q. Lost: Our intelligence. Why? *Amer. Psychol.*, 1964, **19**, 871-882.
8. MICHOTTE, A. E. The emotional significance of movement. In M. L. Reymer (Ed.), *Feelings and Emotions*. New York: McGraw-Hill, 1950. Pp. 114-126.
9. OSBORN, A. F. *Applied Imagination*. New York: Scribner's, 1957.
10. SARBIN, T. R. Role theory. In G. Lindzey (Ed.), *Handbook of Social Psychology* (Vol. 1). Reading, Mass.: Addison-Wesley, 1954. Pp. 223-258.
11. SARBIN, T. R., & HARDYCH, C. B. Conformance in role perception as a personality variable. *J. Consult. Psychol.*, 1955, **19**, 109-111.
12. THORNDIKE, R. L. GT Vocabulary Test. Montreal, Can.: Inst. Psychol. Res., 1957.
13. WALKER, D. E. The relationship between creativity and selected test behavior for chemists and mathematicians. Unpublished Doctoral dissertation, University of Chicago, Chicago, Illinois, 1955.
14. WALKER, H. M., & LEV, J. *Elementary Statistical Methods* (3rd ed.). New York: Holt, Rinehart & Winston, 1969.
15. WALLACH, M. A. *The Intelligence-Creativity Distinction*. New York: Gen. Learn. Press, 1971.
16. WALLACH, M. A., & KOGAN, N. *Modes of Thinking in Young Children: A Study of the Creativity-Intelligence Distinction*. New York: Holt, Rinehart & Winston, 1965.
17. WERNER, H. The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), *The Concept of Development: An Issue in the Study of Human Behavior*. Minneapolis: Univ. Minnesota Press, 1957. Pp. 125-148.
18. WERNER, H., & KAPLAN, B. *Symbol Formation*. New York: Wiley, 1963.
19. WINER, B. J. *Statistical Principles in Experimental Design*. New York: McGraw-Hill, 1962.

Department of Educational Psychology
Eastern Michigan University
Ypsilanti, Michigan 48197

DEVELOPMENT OF MIRROR IMAGE RESPONSES IN INFANCY*

Hope College

JANE R. DICKIE AND WILLIAM H. STRADER¹

SUMMARY

This study investigated methods of recording infant responses to mirror image. Six response categories were recorded in two mirror conditions and one no-mirror condition for 18 male and female infants ages 6 months, 12 months, and 18 months of age. The results showed a shift in body exploration away from self-manipulation toward visual attention to the mirror image. The peak of responsiveness to mirror image appeared in the 12-month-old group.

A. INTRODUCTION

At what point in development does the child have a concept of his own body? How might this development be measured? Perhaps the recognition of an individual's own reflection in a mirror could be associated with body-image formation. Yet how does one infer self-recognition, particularly in nonverbal or preverbal organisms? Gallup (2) has shown particular ingenuity in investigating mirror image recognition in chimpanzees. He put a dot on each subject's shoulder and presented the subject with a mirror. Chimps could only check the location of the dot with the use of the mirror. He found that chimps did indeed use the mirror image to groom themselves and remove the dot. Further, observations of other behavior in the presence of the mirror suggested that the chimps did in fact recognize the image as their own, rather than that of another ape.

The use of mirrors to investigate human self-recognition has been employed for clinical research with schizophrenics (3, 5, 7). However, developmental studies showing self-recognition with infants have not been reported. Stone and Church (4) contend that self-recognition in mirrors does not occur until

* Received in the Editorial Office on August 30, 1974, and published immediately at Provincetown, Massachusetts. Copyright by The Journal Press.

¹ This paper is co-authored by the authors; order does not imply senior author. Requests for reprints should be sent to the first author at the address shown at the end of this article

approximately 10 months of age, though only personal observations were given to support such a contention. Boulanger-Balleyguier (1) found that infants observed over five monthly periods beginning at one month did not show evidence of self-recognition, though they did respond to the mirror as a stimulus object.

This study sought to answer three questions: (a) What method can be used to record infant responses to mirror image? (b) At what age in months does the infant show greatest responsiveness to his own image in a mirror? (c) Are there sex differences in response to mirror image?

B. METHOD

1. Subjects

The Ss were 18 white children from middle-class homes. The sample consisted of six infants (three boys and three girls) in each of three age groups: 6 months, 12 months, and 18 months of age.

2. Procedure

Ss and their mothers (*M*) were escorted into the test room containing a four foot square playpen, a chair for *M*, and a chair and recording table for *E*. The playpen had a one \times two foot covered mirror anchored to one side and a one foot square red taped area adjacent to the mirror. The mirror faced away from *M* and perpendicular to *E*. *E* gave *M* a set of written instructions which explained the procedure. Ss were then tested under three mirror conditions. Order of presentation was counterbalanced within age groups.

The conditions consisted of three three-minute recording periods, as follows: (a) *Dot-mirror*—a 1/4" bright red piece of tape was placed on the S's right cheek below the eye, on the cheek bone; the mirror was uncovered. (b) *Dot-no mirror*—the same as dot-mirror except that the mirror was covered completely with a blue terrycloth cover. (c) *No dot-mirror*—S was exposed to the mirror but without the tape dot.

Before each condition *M* would unobtrusively apply the tape or remove it, depending on the condition. *M* would then place *S* in the middle of the playpen facing the mirror. Only the 6-month group was placed within the red tape area. At the end of each mirror condition, *M* removed *S* from the playpen for two minutes.

3. Behavior Categories

E observed and recorded six categories of behavior. A scan sampling procedure in which *S*'s behavior was recorded at five-second intervals was used.

Time intervals were indicated by a standard Electric Time Corporation timer. The data were collected by a secretarial model shorthand stenograph; one key was used to record each of the six behavior categories. A total of 36 recording instances per condition, per subject, was obtained.

Of the six behavior categories, two recorded attending to the mirror: (a) near mirror (being in red tape area) and (b) orienting (touching, looking) toward mirrors. The remaining four categories recorded self-directed and social behavior: (c) manipulating face around red dot area, (d) playing with self (touching, rocking, handling), (e) crying, and (f) vocalizing (talking, gurgling, cooing). A test on interrater agreement revealed 96.2 percent agreement between raters.

C. RESULTS

Five of the six behavior categories were subjected to $3 \times 2 \times 3$ repeated measures analysis of variance (6). The category "manipulating red dot" was not analyzed because only two Ss exhibited this behavior. The factors analyzed were the three mirror conditions, sex, and the three age groups. To facilitate exposition, the results are reported by factor rather than by analysis of variance table.

Table 1 shows the mean number of responses for the five behavior categories for the three age groups. As the table shows, three of the five categories were significantly affected by age: near mirror ($F = 22.46$; $df = 2, 12$; $p < .01$), orienting to mirror ($F = 5.86$; $df = 2, 12$; $p < .05$), and playing with self ($F = 4.02$; $df = 2, 12$; $p < .05$). The vocalizing category revealed a near significant trend ($F = 3.06$; $df = 2, 12$; $p < .10$). The crying category was not significantly affected by age. Since the 6-month-olds were fairly immobile, the finding that they remained near the mirror is trivial. Therefore, Newman-Keuls test was performed on the near mirror category.

TABLE 1
MEAN NUMBER OF RESPONSES FOR FIVE BEHAVIOR CATEGORIES
FOR THREE AGE GROUPS

Behavior	6 months	12 months	18 months
Near mirror***	30.7	27.7	8.2
Orienting to mirror**	8.6	15.2	4.7
Playing with self**	22.4	12.6	8.1
Vocalizing*	9.8	20.3	15.1
Crying	3.1	7.0	14.0

* $p < .10$.

** $p < .05$.

*** $p < .01$.

The 12- and 18-month groups were found to be significantly different from each other ($p < .01$).

The three mirror conditions significantly affected only one behavior category: orienting to mirror ($F = 6.93$; $df = 2, 24$; $p < .01$). The fewest orientation responses occurred in the dot-no mirror condition ($\bar{X} = 2.16$); dot-mirror had the most responses ($\bar{X} = 13.72$), with the no dot-mirror condition slightly lower ($\bar{X} = 12.77$).

The main effect, sex, did not reach significance for any of the five response categories. None of the interactions between age, sex, or mirror condition reached significance.

D. DISCUSSION

The questions that this study sought to answer have been partially answered by the results. With regard to method, the results of this study suggest that use of the scan method of observing and stenograph recording can be highly reliable. Also, the behaviors selected are high in the infant's repertoire and are sensitive to age changes.

Effects due to age show changes in the predominance of certain behaviors between 6 and 18 months. In this situation 6-month-olds spent most of their time playing with themselves, and even though they were immobile and therefore remained near the mirror, they rarely oriented toward it. The 12-month-olds appeared to show a heightened responsiveness in this situation with more time spent near the mirror and orienting to the mirror and more time vocalizing than either the 6- or 18-month groups. At the same time they showed a decrease in playing with self. This suggests a shift away from physical exploration of self toward greater visual attentiveness toward the image of self in the mirror between 6 and 12 months. By 18 months children were less responsive in this environment. There was a dramatic move away from attention to the mirror as shown by the fewest near mirror and orienting to mirror responses. They also showed the fewest playing-with-self responses. Vocalizing was high but lower than the 12-month group. This vocalizing, unlike that of the 12-month-olds, was predominantly to the mother. It appears that by 18 months the infant was no longer as attentive to the mirror or to exploring his own body physically.

With regard to sex differences, no differences were found in any of the measured behaviors.

These findings support the Stone and Church (4) contention that 10 to 12 months is the beginning of mirror image recognition and, therefore, the greatest attention toward the mirror occurs at this age. We cannot be sure

that the infant recognized this image as himself, as the dot manipulation was not a significant effect. However, the mirror image clearly was a prepotent stimulus object for the 12-month-old. He vocalized to it and oriented toward it significantly more than either the 6- or 18-month groups. Future studies might make use of this method and increase the size of the dot to determine whether infants can use the mirror to recognize self.

REFERENCES

1. BOULANGER-BALLEYGUIER, G. Premieres reactions devant le miroir. *Enfance*, 1964, **1**, 51-67.
2. GALLUP, G. G., JR. Mirror-image stimulation. *Psychol. Bull.*, 1968, **70**, 782-793.
3. KOLB, L. C. Disturbances in body-image. In Arieti, S. *American Handbook of Psychiatry (Vol. 1)*. New York: Basic Books, 1959.
4. STONE, L. J., & CHURCH, J. *Childhood and Adolescence* (2nd ed.). New York: Random House, 1968.
5. TRAUB, A. C., & ORBACH, J. Psychophysical studies of body image: I. The adjustable body-distorting mirror. *Arch. Gen. Psychiat.*, 1964, **11**, 53-66.
6. WINER, B. J. *Statistical Principles in Experimental Design*. New York: McGraw-Hill, 1962.
7. WITTEICH, W. J. Body-image and psychopathology: Pilot study. Unpublished report of Office of Naval Research as reported in Traub, A. C., & Orbach, J. "Psychophysical studies of body-image: I. The adjustable body-distorting mirror." *Arch. Gen. Psychiat.*, 1964, **11**, 53-66.

Department of Psychology
Hope College
Holland, Michigan 49423

ABBREVIATIONS OF WORDS USED IN THE TITLES OF JOURNALS

(One-word titles are never abbreviated. The word "the" is not used, nor its equivalent in any other language. The word "of" or its equivalent in other languages is used only to discriminate what would otherwise be identical titles in different languages. The word "and" is always used, but indicated by "&" in the Roman alphabet. Only English words are indicated here, but the corresponding words in other languages should receive a corresponding abbreviation. All abbreviations and all one-word titles should be in italics.)

Abnormal	<i>Abn.</i>	Japanese	<i>Jap.</i>
Abstracts	<i>Abst.</i>	Journal	<i>J.</i>
American	<i>Amer.</i>	Mathematical	<i>Math.</i>
Anatomy	<i>Anat.</i>	Measurement	<i>Meas.</i>
Animal	<i>Anim.</i>	Medical	<i>Med.</i>
Applied	<i>Appl.</i>	Mental	<i>Ment.</i>
Archives	<i>Arch.</i>	Monographs	<i>Monog.</i>
Association	<i>Assoc.</i>	Neurology	<i>Neurol.</i>
Attitude	<i>Attit.</i>	Opinion	<i>Opin.</i>
Australian	<i>Aust.</i>	Orthopsychiatry	<i>Orthopsychiat.</i>
Behavior	<i>Behav.</i>	Personality	<i>Personal.</i>
British	<i>Brit.</i>	Personnel	<i>Person.</i>
Bulletin	<i>Bull.</i>	Philosophy	<i>Philos.</i>
Bureau	<i>Bur.</i>	Physics	<i>Phys.</i>
Canadian	<i>Can.</i>	Physiology	<i>Physiol.</i>
Character	<i>Charac.</i>	Proceedings	<i>Proc.</i>
Children	<i>Child.</i>	Psychiatry	<i>Psychiat.</i>
Chinese	<i>Chin.</i>	Psychoanalysis	<i>Psychoanal.</i>
Clinical	<i>Clin.</i>	Psychology	<i>Psychol.</i>
College	<i>Coll.</i>	Psychosomatic	<i>Psychosomat.</i>
Comparative	<i>Comp.</i>	Quarterly	<i>Quart.</i>
Consulting	<i>Consult.</i>	Religious	<i>Relig.</i>
Contributions	<i>Contrib.</i>	Research	<i>Res.</i>
Development	<i>Devel.</i>	Review	<i>Rev.</i>
Educational	<i>Educ.</i>	School	<i>Sch.</i>
Experimental	<i>Exper.</i>	Science	<i>Sci.</i>
General	<i>Gen.</i>	Social	<i>Soc.</i>
Genetic	<i>Genet.</i>	Statistics	<i>Stat.</i>
Indian	<i>Ind.</i>	Studies	<i>Stud.</i>
Industrial	<i>Indus.</i>	Teacher	<i>Teach.</i>
International	<i>Internat.</i>	University	<i>Univ.</i>
Italian	<i>Ital.</i>		

Preparation of Manuscripts for The Journal Press

GENERAL INSTRUCTIONS

1. The proper sequence for the parts of your submitted manuscript is as follows: (a) text (b) references, (c) footnotes, (d) tables, (e) figures, and (f) figure legends. However, monographs start with a table of contents and may have an acknowledgment page before the text and an appendix immediately after the text.
2. Use heavy typewriter paper, $8\frac{1}{2} \times 11$ inches, double-space *all* lines, and leave margins for editorial work. Do not use onionskin, odd sizes, and abrasive or wax finishes.
3. Submit original typewritten version and one copy. Retain second copy for proofing.
4. Retype any page on which written corrections have been made.
5. Do not begin a sentence with a numeral.
6. A summary at the beginning of the text is required for articles over 500 words.
7. Each quotation should indicate the page number of the original source. The original publisher must give permission for lengthy quotations and use of tables or figures.
8. Do not fold your manuscript.
9. Enclose a submission letter, with a statement that the manuscript is not under consideration elsewhere. If you are unknown to the Editors, kindly give your credentials.

FORMAT AND SPECIFIC INSTRUCTIONS

A. TEXT DIVISIONS

I. THE TITLES OF JOURNAL ARTICLES AND THE MAJOR SUBDIVISIONS OF MONOGRAPHS ARE PRINTED IN TEN-POINT CAPS CENTERED ON THE PAGE

A. THE NEXT SUBDIVISION TITLE IS PRINTED IN CAPS AND SMALL CAPS CENTERED ON THE PAGE

1. *Then Italics, with Principal Words, Upper and Lower Case, Centered on the Page*
- a. *Then italics, upper and lower case, 1-em run-in side head.*
- (1). *Then italics, upper and lower case, 2-em run-in side head.*
- (a). *Then italics, upper and lower case, 3-em run-in side head.*

[Further subdivision should be merged into the text without marginal indentation, and should be numbered with small letters.]

B. REFERENCES

References should be arranged in alphabetical order by author, numbered and referred to in the text by number (2). Double-space!

The proper form of a book reference is as follows:

2. DOE, J. The Preparation of Manuscripts. New York: Holt, 1963. Pp. 400-418.

The proper form of a journal reference is as follows:

2. DOE, J. The preparation of manuscripts. *J. Gen. Psychol.*, 1963, 68, 450-462.

If in the text it is desirable to refer to a page, thus (2, p. 45).

C. FOOTNOTES

Use as few as possible and number consecutively in the text thus.¹

- ¹ Footnote (on the separate footnote page). Double-space!

D. TABLES

Each table should be typed on a separate sheet and should be Arabic numbered (Table 2). Each column requires a heading. Vertical lines should be avoided. Mention tables consecutively in the text and indicate approximate insertion points.

E. FIGURES

Figures should be submitted as glossy prints of the approximate size for final reproduction (ordinarily $4\frac{1}{2}$ inches in width). Lettering and lines should be sharp and clean. Figures should be Arabic numbered (Figure 2) in the text, and have consecutive mention and approximate insertion points. Each figure requires a legend, but all legends should be submitted double-spaced on a separate Figure Legends page.